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Bank Depth, Stock Market Liquidity and Urbanisation at Various Stages of Economic Development and Time Period

---a Simultaneous Equations Approach

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Abstract

The finance and growth nexus has been discussed since the last century. Elements related to them also attract a lot of attentions in the research area. This study explores the systematic interaction among bank depth, stock market liquidity, and urbanisation. By constructing a Simultaneous Equations Model (SEM) consists of three equations, cross-equations correlations were taken into account in the Three-stage Least Squared (3SLS) estimation model using a large and new panel dataset of 43 economies for the time period 1990 to 2014. In the meantime, multidimensional analysis was conducted by splitting the sample into different groups to study the difference among countries in various stages of economic development and time period. Positive and significant impact is found from bank depth to stock market liquidity while mutual positive effect exists between urbanisation and bank depth. The stock market liquidity impact urbanisation positively but such impact is not significant. However, since both bank depth and stock market liquidity both positively predict urbanisation when entered together in the regression, the results are consistent with the views that financial development provides important services to growth, in this case, the growth of urbanisation. Limitations and further research are suggested in the last.

Keywords: bank depth, stock market liquidity, urbanisation, simultaneous equations model, three-stage least squares

1. Introduction

Economists disagree sharply about the finance and growth nexus. The role of the financial sector in the economic growth, is always a question in the financial research area. Research that clarifies the understanding of the role of finance in the economic growth will have policy implications and can help shaping the future policy-oriented studies. The hypothesis that finance increases growth has been tested in various ways with mostly result in a significant positive effect. For example, King and Levine (1993a; 1993b; 1993c), Roubini and Sala-i-Martin (1992), Pagani (1993), Jayaratne and Strahan (1996), Levine (1997;1998), Arestis and Demetriades (1997), Rajan and Zingales (1998), Lindh (2000), and Levine et al. (2000). Some papers, like Demetriades and Hussein (1996), and Luintel and Khan (1999), fail to find a causal effect of finance on growth.

It cannot be denied that finance is one of the most important components of the modern economy. However, it is difficult to capture and measure the level of the very wide term “finance”. Even for the proxies of financial development, the related researchers have not come to an agreement on which measurement can represent it best. Therefore, to be more specifically, finance consists of two general divisions. According to Levine (2005), Cihak, Demirguc-Kunt, etc. (2013), the development of finance is studied by the different conditions of financial institutions (such as banks and insurance companies) and financial markets (including stock markets, bond markets, and derivative markets). For these two aspects of the financial development, banks and stock markets can well represent them respectively in a large extent.

As regards financial depth, the variable that has received much attention in the empirical literature on financial development is private credit to GDP. The proxy was also used by Levine and Zervos (1998), Beck, Levine, Loayza (2000), Beck and Levine (2004) and Demirguc-Kunt, Feyen, Levine (2011) and is considered to be a better measurement for the degree to which banks ease information and transaction costs as it can isolates bank credit to the private sector and therefore excludes credits by development banks and loans to the government and public enterprises. Many existing literatures use it as a proxy for the whole financial intermediaries development, Levine and Zervos (1998) and Levine (1998). However, it is arguable that the proxy cannot capture the development level of the whole financial intermediaries, but is a good proxy for the bank depth, which will be employed in this study.

For the financial markets, stock market is mostly discussed in the previous research. To capture the conditions for the stock market, various proxy were developed in the empirical research like Value and Market Capitalization (Levine and Zervos, 1998; Rousseau and Wachtel, 2000). However, when considering the stock market, more liquid markets could ease investment in long term, potentially more profitable projects, thereby improving the allocation of capital and enhancing prospects for long term growth. The more liquid the stock market, the larger the amount of savings that are channelled through the stock market. Therefore, a more liquid stock market is expected to lead to higher stock market development (Levine and Zervos, 1998). The stock market turnover ratio is a relatively good proxy for the stock market liquidity. The turnover ratio is not a direct measure of trading costs or of the ability to sell securities at posted prices. Rather, the turnover ratio measures trading relative to the size of the market. It therefore reflects trading frictions and information that induces transactions. The logic of using this variable is that higher turnover means more liquidity, which in turn allows the market to be more efficient.

Rather than finance, the growth aspect in the finance growth nexus is a much historical and wider element which related to nearly all the economic activities. Nowadays, the urbanisation issue has attracted attention because of its great significance to the harmonious development of the economy and the society. Research has been done on correlations between elements like financial development, income gap, country’s openness (Baltagi, Demetriades and Siong, 2009), technology improvement, customer demand

(Panda and Tapan, 2003), foreigh direct investment (Carkovic, 2002), trade credit and industry growth (Fisman, Love, 2003), currency rate changes, currency demand, and insightful results and fingings were generated after related these macroeconomnic elements together.

Based on the concerns that finance and growth are related, are bank depth, stock market liquidity, and urbanisation related as well? What is the systematic interaction among these three elements? Will the correlation be different for countries at various stages of economic development? Will the interaction be the same for different time measurement and special financial event? Driven by these assumptions and questions, this study will discuss the correlation between bank depth, stock market liquidity, and urbanisation using panel data of 43 economies from 1990 to 2014.

The correlation is discussed in accordance with a simultaneous model to reflect the current condition between financial development and urbanisation development. The results of this study will clarify the relationship between financial development and urbanisation development which can not only provide an important policy orientation for countries financial development and urbanisation development, but also has important inspiration and reference for other similar countries on financial and economic policy formulation.

The study builds a Simultaneous Equations Model (SEM) formed by three inter-related equations, named the bank depth equation, the stock market liquidity equation, and the urbanisation equation. Following the modelling in the previous work (Shrieves and Dahl, 1992; Greene, 2002), a standard structural Simultaneous Equations Model (SEM) is estimated, thereby allowing a non-zero correlation between the residuals of the equations for each dependent variable. It is notable that failure to allow for the interdependence across equations could be benign or it could confound the correlation of residuals with the effects of the independent variables. By using this model, the model explicitly recognizes the endogeneity of changes in the dependent variables, and as such, is preferable to single-equation Ordinary Least square (OLS) (Greene, 2002). Thus the study is able to contribute to the literature by examining the systematic interaction among bank depth, stock market liquidity, and urbanisation.

Simultaneous estimation techniques of Two-stage Least Squared (2SLS), Three-stage Least Squared (3SLS), and Seemingly Unrelated Regression (SURE) are used to access the systematic interactions among the three elements. A comparison of these three different econometric estimation methods will also be discussed in order to help building the simultaneous model.

As the sample economies group consist of countries and economies at various stages of economic development, the difference between them is also studied afterwards. Since the dataset is a panel dataset and consists both cross country data and time series data, it is important to take the time difference into consideration for the further analysis. As a major event in the financial field, financial crisis attracts a lot of attention over the years in both practice and academic research areas. The initial model is then tested again on the sub time group split by the recent 2007-2008 international financial crisis. Regression analysis is employed before the crisis, in the crisis, and after the crisis.

Regards of the research about finance and growth, researchers are interested in finding the long run relationship and the short run relationship. Since the dataset is of annual data, the result that the model generated is for the short run relationship. However, long run relationship is also of great importance, especially for a country's macroeconomic policies (Levine, Loayza and Beck, 2000). Thus, when taking the time difference into consideration, a long run dataset of a 5 year interval is also generated based on the annual data. And great variations are found in all the above multi-dimensional comparison analysis.

Conclusions were found from the empirical results that 1) positive and significant impact from bank depth to stock market liquidity while mutual positive effect exists between urbanisation and bank depth. The stock market liquidity impact urbanisation positively but such impact is not significant. However, since both bank depth and stock market liquidity both positively predict urbanisation when entered together in the regression, the results are consistent with the views that financial development provides important services to growth, in this case, the growth of urbanisation; 2) the magnitude of relationship differs for economies sample group in different economic development level and time period. The relationship cannot aggregate to a generalisation. Thus, different monetary and fiscal policies should be adopted according to the country's own macroeconomic environment; 3) financial crisis made a big impact on the systematic interactions among the bank depth, stock market liquidity, and urbanisation; 4) stability is found to be of great importance for the growth.

This research of the MRes dissertation is an initial stage for the Ph.D research project. The multi-dimensional empirical findings provide an insightful overview for the broad topic of finance and growth. Limitations exist due to the nature of data and the short length of the 12 months MRes programme and further research targeting points were found of the reference for the future research. Further research problems like the impact of financial crisis on the finance and growth in wide aspects like stock market liquidity, urbanisation is worth exploring using simultaneous equation model to find the systematic interaction with a control of the correlated residuals in the equations. Also, stability is found to be a significant element for the overall growth. Therefore, more detailed research about the direct and indirect impacts of stability in both financial institutions and financial markets is worth researching.

It is worth mentioning that the total length of this dissertation is _____words. It does not exceed the maximum word limit of 35,000 words for the MRes dissertation. As this dissertation has high quantitative elements, according to the Nottingham Business School MRes Student Handbook 2015-2016 in page34, it may be of a shorter length than the maximum word limit.

The rest of the dissertation is organised as follows. Section 2 reviews the related literature, Section 3 describes the research methodology including data, variables, model and estimation methods, Section 4 discuss the empirical results and Section 5 concludes.

2. Literature Review

2.1 Finance and Growth

2.1.1 Financial development theory

In the financial development theory, the main research is the relationship between finance and economic growth, which is, exploring the financial system's (including financial intermediaries and financial markets) role on economic growth to conclude how to establish an effective financial system and combine it together with monetary policies to maximize economic growth. Besides, pursuing the best financial resources allocation to achieve sustainable financial development and ultimately leads to sustainable economic growth is also an important part in the system of the theory.

Origin

Researchers have been thinking about the role of finance in economic growth since banks generated. Financial Development theory developed along with the grown of Development Economics. But in the first phase of development economics (in the late 1940s to early 1960s), development economists did not investigate specialised research on financial related topics. Thus, Structuralism was in the dominant

position in that stage. Finance was in the subsidiary and dominated position since it became the tool for industrialization, planning, and capital accumulation. The development of finance has been neglected. After the mid-1960s, the development economics went to the second phrase when Neoclassicism replaced Structuralism and attention was paid to the role of markets. Finance industry thus got the appropriate developing space.

The Initial Stage

During the pursuit of economic development, a group of newly independent countries subjected to various degrees of constraints on saving and funding shortages. However, the lagging financial development and inefficient operation of financial systems are the real reason for inhibiting the economic growth. In the late 1960s and early 1970s, some economists began to research on the relationship between finance and economic growth. Representatives like Goldsmith (1969), McKinnon (1973), Gurley and Shaw (1955), Patrick (1966) published research about economic development and financial, which then created the theory of financial development.

The initial stage of financial development - the role of finance in the economy

Gurley and Shaw (1955) published paper named "Financial Aspects of Economic Development", which opened a prelude to the theory of financial development. Through building a financial development model from simple to complex, they proved that the higher the stage of the economic development, the stronger the role of finance. In 1960, they tried to establish a broad monetary financial theory exploring a variety of financial assets, diversified financial institutions, and comprehensive financial policies. Gurley and Shaw (1955) further studied the above question by attempting to develop a finance theory including monetary theory and a financial institutions theory including banking theory as they believe that financial development is the motivation and power to promote the economic development. Patrick (1966) presented in his paper "Financial Development and Economic Growth in Underdeveloped Countries" about financial problems of demand-driven and supply-leading. He believes that because the financial system can improve the existing capital structure, effectively allocates the resources, stimulate savings and investment, policies need to give priority to finance in less developed countries. That is, make us of the promoting function of the supply of money. While different from financial development policies that rely on the promotion from the demand, the policies consider financial development before the demand of financial services instead of considering it after demand raises along the economic development. Financial development can be passive and relatively backward, but also can be active and relatively antecedent.

The structure of financial theory - the theory formed the basis of financial development

The outstanding contribution of Goldsmith (1969) is the foundation of financial development theory. In his book "Financial Structure and Development" (1969), he points out that the responsibilities of financial theory are to identify the main economic factors that decide a country's financial structure, financial instruments stocks, and financial transactions flow. He proposed creatively that financial development means the development of the financial structure. Combining qualitative and quantitative analysis, cross-country comparison and longitudinal time series comparison, he established a basic measurement system of a country's financial structure and the level of financial development. By analysing data from 35 countries for nearly 100 years, Goldsmith (1969) draw the conclusions that finance relevance rate is positively correlated with the level of economic development. His research provided important methodology reference and analytical basis and has become an important origin for various financial theories developed after the 70s.

Establishment

In 1973, the publication of two books: McKinnon's "Money and Capital in Economic Development" (1973) and Shaw's "Financial Deepening in Economic Development" (1973) marks the real establish of financial development theory about developing countries or regions. McKinnon (1973) and Shaw (1973) made insightful comments on the relationship between financial development and economic development, and the financial development in developing countries or regions. The "financial repression" and "financial deepening" theory they proposed aroused strong repercussions in economic research and is considered a major breakthrough in the development of monetary economics and financial theory. The monetary and financial reform and financial policies in many developing countries are deeply influenced by the theory.

Financial Repression

McKinnon (1973) believes that due to various restrictions on the financial activities in developing countries such as strictly controlled interest rates and exchange rates, there is a distortion of interest rates and exchange rates which make them cannot accurately reflect the true supply and demand of the funds and the foreign exchange. When interest rate it is considered to be depressed, there is inflation, or on both cases: On the one hand, controlled interest rates led to a credit quota control and reduce the allocative efficiency of credit funds; On the other hand, the return of money holders tends to be very low or even negative, resulting in a large number of microeconomic individuals no longer internally accumulated in monetary form by holding cash, deposits, fixed deposits. Instead, they invest in goods and led to a further decline in bank savings because of the reduced media function, reduced investment, and slow economic development. This condition is referred to as "Financial Repression" by McKinnon (1973). This kind of financial repression constrains the internal savings in developing countries and strengthens the dependence on foreign capital. However, in the financial repression theory, McKinnon (1973) proposed, the definition of money is confusing and contradictory. He defined money as broad money M2, which not only includes cash in circulation and demand deposits but also includes fixed deposits and savings deposits. But he also stressed the so-called outside money in the model, that is, fiat money issued by the government, which excludes all kinds of deposits in the banking system. Thus there are two conflicting definitions of money in the same monetary theory.

Financial Deepening

Shaw (1973) believes that there are mutual promotion and mutual restraint between the financial system and economic development. On the one hand, a sound financial system is capable of effectively mobilize savings and guide them to the productive investment, thereby promoting economic development; On the other hand, positive economic development can also stimulate the development of the financial sector by increasing the national income and promoting the demand for financial services of economic individuals. Thus, a virtuous circle of mutual promotion between economic and financial development is formed. Shaw (1973) noted that financial deepening generally can show dynamic development of three levels: first, financial growth, namely the expanding of the size of finance, of which the level can be measured by indicator M2 / GNP or FIR; second, financial intermediaries, and constantly optimised financial institutions; third, gradually improved financial market mechanism or market order, market mechanism can help optimising the allocation of financial resources. These three levels of financial deepening have mutual influences and mutual causality. According to the research and analysis of McKinnon (1973) and Shaw (1973), appropriate financial reform can effectively promote the economic growth and development and create a virtuous circle between financial deepening and economic development. To explain this virtuous cycle better, Ronald McKinnon proposes a revised Harrod-Domar Model (1946). In the modified model, McKinnon (1973) abandoned the assumption that the saving propensity is a constant number. He pointed out that, in economic growth, portfolio effect has an impact on savings, and therefore, as a function of economic growth, saving propensity is variable. In the same time, savings are also affected by many other

variables including the actual return rate of money. By changing Harrod-Domar growth model (1946), McKinnon (1973) analysed the release of financial repression. Countries can not only directly increase savings by increasing the saving propensity, thus increase investment and promote economic growth, also can in turn increase savings through further economic growth. Therefore, the implementation of financial reforms, the lifting of financial repression, is the key to achieving a virtuous circle between financial deepening and economic development.

Development

Since 1973, McKinnon (1973) and Shaw (1973)'s theory of financial deepening had a tremendous impact in the western economic field. Studies on the financial theory and constantly develop new upsurge research. Many economists have put forward their new views on the financial development topic.

The first generation

The first generation of McKinnon (1973), Shaw (1973) prevailed from the mid-1970s to the mid-1980s, representatives including Kapur (1976), Mathieson (1980), Galbis (1977) and Fry (1978), etc., their main research is empirical studies of financial deepening.

Kapur (1976) studied financial deepening in the underdeveloped and relatively closed economy which has surplus labour force but idle fixed capital. He believes that there is fixed ratio relationship between the fixed capital and working capital. Under the idle fixed capital conditions, the key factor in determining output depends on how much working capital or cash flow can companies get. Kapur (1976) accepted McKinnon (1973)'s view that apart from the influence of other factors, the actual inflation rate is influenced by inflation expectations. In the same time, Kapur (1976) gave up on McKinnon (1973)'s view of focusing on internal financing and suggests that the net investment part of capital flows normally rose entirely through the bank. The general impact of commercial banks on the real economy is achieved through working capital. The amount of capital flows depends on the demand for money, monetary expansion rate, and loans to monetary ratio. Mathieson (1980) has a similar opinion with Kapur (1976), he also discusses the impact of financial deepening investment from investment amount angles. However, there are two different assumptions with those of Kapur (1976). First, Mathieson (1980) assumes that all fixed capital can be fully utilized, that is, in real life, there is no idle fixed capital like Kapur (1976) said. Second, Mathieson (1980) assumes that what enterprises borrow from banks is the fixed ratio of total capital, in other words, enterprises not only need to borrow part of the capital flow, and also part of the fixed capital. He also noted that economic growth is ultimately constrained by the supply of bank loans, while the supply of bank loans is influenced by the interest rate of deposits to a large extent. In order to keep the stable economic growth, it is necessary that the real interest rate must reach its equilibrium level. Therefore, the interest rate controls need to be cancelled in order to realise the financial liberalization. Same as Mathieson (1980), Galbis (1977) also based on the divided assumption of economies in developing countries, suggesting that the economies of developing countries have certain characteristics. These characteristics result from the situation that the resource occupied by the inefficient sector cannot be transferred to the efficient sector, which creates long-term inconsistence in the rate of return on investment among different departments and thus leads to inefficient allocation of resources. He proposed that financial assets' low interest rate is the main indicator of financial repression. It is an important factor hampering economic development. In order to overcome financial repression, making full use of the active role financial intermediaries have on promoting economic growth and development, raising the effective interest rate of financial assets to its equilibrium level, can help increasing the actual supply of investment resources to the equilibrium level of demand. Fry (1978) believes that the investment scale and efficiency are the determining factors of economic growth. But in developing countries, both of these are influenced by monetary and financial factors to a large extent. He believes that, in static equilibrium conditions, the actual growth rate will be

equal to the normal growth rate. However, in a dynamic economy, the two are not necessarily equal. This is because the actual growth rate consists of two parts, namely, normal growth and cyclical growth. Fry (1978) also introduced lagged factor into the models, which can more accurately reflect the actual impact of changes in savings and investment on economic growth.

Second Generation

The second generation of McKinnon (1973), Shaw (1973) prevailed in the mid-late 1980s and early 1990s. There are representatives like Bencivenga and Smith (1991), Levine (1991), Lucas (1988), Greenwood (1990) and so on. The explanation of the mechanism for the development of financial institutions and financial market in the theory of financial development during this period of is formed from utility function. Various models with the micro foundation were established and factors which are inconsistent with the perfect competition concept such as uncertainty (liquidity shocks, preference shock), asymmetric information (adverse selection, moral hazard), and monitoring costs were introduced in the model. They made a normative interpretation for the formation of financial institutions and financial markets on the basis of comparative research.

The formation of the financial system

Representative endogenous financial markets models include models from Bencivenga and Smith (1991), Smith (1998), Dutta and Kapur (1998).In Bencivenga and Smith's (1991) model, individuals' random or unpredicted liquidity needs to be resulted in the formation of financial institutions. The role of financial institutions is to provide liquidity rather than overcome information friction. In Smith's (1998) model, the spatial separation and limited communication led to the formation of financial institutions. In this model, the individuals face the risk of moving. Because when moving occurs, the individuals need to liquidate their assets and thus face the risk of migration. To avoid this risk, the individuals need the services provided by financial institutions. In Dutta and Kapur's (1998) model, the individuals' liquidity preference and liquidity constraints led to the formation of financial institutions. The existence of financial institutions enables the individuals to hold deposits of financial institutions. Financial institutions deposits have higher efficiency in providing liquidity services compared with other public debt and legal tender and can help easing the detrimental influences of liquidity constraints on consumer behaviour.

Representative endogenous financial markets models include models from Boot and Thakor (1997), Greenwood and Smith (1996). These models explained the formation mechanism of the financial markets and the formation mechanism of financial institutions. Boot and Thakor (1997) start from production and economic prospect, suggesting that the composition of the financial markets put money into financial institutions, and financial institutions give loan using the deposits and thus providing funds for manufacturers. In financial institutions, individuals cooperate together and coordinate their actions against the manufacturers. Greenwood and Smith (1997) indicated in the model that the fixed operating costs or the participating costs of financial markets resulted in the endogenous formation of the financial market. That is, there are threshold effects in the formation of the financial market. Only when the economy developed to a certain level, the number of participants who have the ability to pay the cost and the number of transactions would become more. Thus, the financial market was formed.

The development of the financial system

After the formation of financial institutions and financial markets, the development level of them will change along with the changes in domestic and international conditions. Economists theoretically explained this dynamic development process. Greenwood and Smith (1996), and Levine (1997) introduced fixed fee or fixed transaction costs in their model respectively to show how financial institutions and financial markets develop along with the increase in per capita income and per capita wealth. In the early stages of

economic development, per capita income and per capita wealth is very low. The supply of financial services was unable to produce due to the lack of demand for financial services. So, financial institutions and financial markets do not exist. However, when the economy grows to a certain stage, there is an incentive for some rich people to make use of financial institutions and financial markets, and to pay a fixed entry fee because their income reached a critical value. Thus, financial institutions and financial markets are able to be established. With the pass of time and the further development of the economy, people whose income and have reached the critical value become more and more. The use of financial institutions and financial markets also witness a big growth, which indicates the continuous develop of the financial institutions and financial markets.

Financial Restraint

The results of financial liberalization in developing countries were once very disappointing. Many economists began to review the conclusions and limitations of the previous economic development theories. Based on the new Keynesian analysis, Stiglitz (1985) summarizes the reasons for market failure in the financial markets. He believes that government should take an indirect control mechanism on the regulation of financial markets and establish the regulation scope and regulatory standards on the basis of certain principles. On this basis, Hellman, Murdock and Stiglitz (1997) presented the theoretical framework of financial constraints.

Core content

Hellman, Murdock and Stiglitz (1997) believe that the financial constraint means that government creates opportunities for rent in the private sector through a series of financial policies in order to prevent harm from financial repression and encourage banks to take the initiative to avoid the risk. Financial policies include a control for deposit and lending rates, market access restrictions, and even control on direct competition in order to influence the distribution of rents between the production sector and the financial sector. Also, by creating opportunities for rent, one can mobilize the initiative of production, investment and save in the financial sector, production enterprises and all residents. The government can play a positive role in this, taking certain policies to create beneficial conditions for the banking system and encourage them to explore new markets and mobilize savings, thereby promoting financial deepening.

Prerequisites

Hellman, Murdock and Stiglitz (1997) believe that, although the financial constraint theory demonstrated from different aspects that financial constraints are reasonable financial policies for developing countries, there are similarities in some respects between financial constraints and financial repression. In the implementation of financial constraints policy, the process may be poor or distorted due to various reasons, among which the biggest threaten is the transformation from financial constraints to financial repression. Therefore, to ensure that financial constraints can achieve the best results, certain prerequisites need to be formed such as stable macroeconomic environment, low inflation, positive real interest rates, real commercial banks, little or no intervention of government to the business enterprises and banks to ensure that the behaviour of banks and corporates match with market requirements.

Difference

Hellman, Murdock and Stiglitz (1997) pointed out that because financial constraints can create opportunities for rent, while financial repression produces rent transfer, creating opportunities for rent and rent transfer is completely different. In financial repression, higher inflation caused by the government makes wealth transfer from the household to the government. Thus, the government then become the target of various interest groups for rent-seeking activities. The essence is that the government can seize resources from the private sector. However, the financial constraints policy can help creating renting

opportunities for the private sector, especially for financial intermediaries, which help to increase the returns and benefits of competitive activities. These renting opportunities formed due to deposit and loan spreads resulting from controlled deposit rates. Banks get these rents through expanding its deposit base and monitoring the implementation of the loan portfolio, thereby promoting financial deepening.

Influences

Hellman, Murdock and Stiglitz (1997) and some others believe that although the capital requirement is also a tool to prevent the bank from moral hazard, in developing countries, controlling deposit rates is more effective than controlling bank capital. In the financial constraint environment, as long as the bank absorbed new deposits, they can get the rent, which then prompted banks to seek new sources of deposits. If the government restrict market access, it helps banks to attract more deposits and increase investment better which thereby increase the supply of funds. Establish a reasonable amount of savings institutions can absorb more deposits. Attracting more depositors in financial institutions is an important part of financial deepening in developing countries. So, financial constraints can promote financial deepening. The financial constraint concept comes after Hellman, Murdock and Stiglitz (1997)' research on Southeast Asian. The financial crisis in Southeast Asian makes them research their financial constraint theory (1999) again. Some also believe that this crisis proved against their theory. In fact, the financial constraint is a transitional policy in developing countries helping them transform from financial repression to financial liberalization. It targets the poor information exchange, lack of supervision in finance for developing countries when the process of economic transition exists and helps government play the role when the market failed to do so. Therefore, it is not completely opposite the financial deepening policy, but can rich and develops the financial deepening theory.

2.1.2 Empirical evidence

The hypothesis that finance increases growth has been tested in various ways with mostly result in a significant positive effect. For example, King and Levine (1993a; 1993b; 1993c), Roubini and Sala-i-Martin (1992), Pagani (1993), Jayaratne and Strahan (1996), Levine (1997;1998), Arestis and Demetriades (1997), Rajan and Zingales (1998), Lindh (2000), and Levine et al. (2000). Some papers, like Demetriades and Hussein (1996), and Luintel and Khan (1999), fail to find a causal effect of finance on growth.

Questions such as whether specific conclusions of the finance development theory are consistent with the actual situation in developing countries, whether government policies can be put into practice in developing countries, need continuous research. Among them, a very important task is to use the empirical data in developing countries to test the theoretical models. But early empirical research findings can only confirm the existence of the correlation between the financial development and economic growth, but cannot confirm whether there is a causal relationship (Levine, 1997) between the two. Subsequent empirical research makes use of the recently developed analytical techniques to analyse more comprehensive data sets and find that financial development is one of the reasons for the long-term stable economic growth.

Evidence since 1980s

After the 1980s, a large number of various empirical studies on financial development theory were presented in the world. The scope of these empirical studies is broader and more content; almost every point put forward by McKinnon (1973) and Shaw (1973) have verified by the empirical studies. According to Kitchen's (1986) summary, from 1973 to 1984, the number of the main empirical studies by economists about financial repression was 17. In these studies, except for a few who failed to get a positive result, the vast majority of the results strongly support the conclusions of the theory of financial repression.

IMF published research paper "Interest Rate Policy in Developing Countries" in 1983. In Appendix 3 in the paper, Lanyi and Saracoglu (1983) analysed the relationship between interest rate, financial assets growth, and gross domestic product (GDP) using data from 21 developing countries in the time period 1971-1980. According to their result, countries with positive real interest rates have a high average growth rate of financial assets and GDP; countries with negative real interest rates have a low average growth rate of financial assets and GDP, some even have negative growth rate. This reflects, there is a clear positive correlation between real interest rate and the actual rate of growth of financial assets and the growth rate of the real gross domestic product. The conclusions of this positive correlation are consistent with Mckinnon (1973) and Shaw (1973), who proposed the theory of financial development. But a positive correlation between the three variables just illustrates one aspect of the problem, and the causal relationship between the three variables is more important and needs to be proved. In a variety of empirical studies, it is more difficult to prove the causality relationship.

Core content about Fry (1980)'s research in financial development theory is also about the financial repression and financial deepening problems in developing countries. He elaborated on this issue theoretically and did empirical research using data of many developing countries. Fry (1978) tested Shaw (1973) and McKinnon (1973)'s basic conclusions and their theoretical disagreement about transmission mechanism in the paper "Money and Capital or Financial Deepening in Economic Development". The verification results show that Shaw (1973)'s debts media theory is valid, but McKinnon (1973)'s complementary hypothesis is untenable. In 1980, Fry then analysed the cost of financial repression in developing countries. In this analysis, Fry (1980) uses actual deposit rate is limited below its market equilibrium level as a proxy for financial repression to analyse data from 61 selected developing countries in the mid-1960s to the mid-1970s. Then he concluded that the cost of financial repression is that every 1% the actual deposit rates are below their market equilibrium interest rate leads a 0.5% loose on economic growth.

Measurement since the 1990s

Empirical studies in the early 1990s provided empirical evidence for functions that financial development does promote economic growth and made a clear distinction between the mechanism of financial intermediaries, the role of financial markets in economic growth, and institutional factors which determine the financial development and financial structure.

Empirical evidence at macro-level

In the early 1990s, King and Levine (1993) give up on the tradition of targeting on developing countries in the research of financial development theories and seek to establish the general theory of financial development, including developing and developed countries. They start with the impact of the financial development on economic growth from the perspective of financial functions, especially the impact on total factor productivity (TFP). (King and Levine, 1993)

While many researchers have already suggested that functions of finance have important promoting impact on total factor productivity (TFP) but failed to find a quantitative proxy to measure the function of finance, King and Levine made a breakthrough by finding the measurement of financial functions. King and Levine (1993) suggest four indicators to measure the overall conditions of financial intermediaries (Depth indicators, Bank index, Private indicators, Privy indicators) on the basis of Goldsmith (1969) to represent the financial development level and then use ordinary least squares to analyse data in 80 countries between 1989 and 1960.

They found that the development of the size and function of financial intermediaries not only promote the capital formulation in economic activities, also stimulate the growth of total factor productivity (TFP) and

long-term economic growth. In order to examine the causality direction between financial development and economic growth, King and Levine test the relationship between the initial level of financial development (1960) and economic growth (1960 to 1989). It was found that difference in initial stage of financial development is a good predictor of the difference between the levels of economic growth afterwards, even after controlling variables like income, education, political stability, trade, fiscal and monetary policy. So, King and Levine suggest that financial development is the reason, economic growth is the result. Their research methodology and overall design had a profound impact on subsequent researchers.

After King and Levine studied the impact of financial intermediation development on economic growth, Levine and Zervos (1998) studied the impact of stock market development on economic growth. They use the Second Stage Least Squares (2SLS) method to analyse data on 47 countries from 1993 to 1976. The results show that the development of the stock market liquidity and banks not only significantly positively related to the economic growth, capital accumulation, and productivity growth in the same period but also are very good predicting proxies for them. These conclusions are consistent with the theoretical findings of Bencivenga et al. (1995).

In order to determine whether there is a long-term relationship between financial development and economic growth, Rousseau and Wachtel (1998) apply Vector Error Correction (VEC) model to analyse data from five countries: the United States, Britain, Canada, Norway and Sweden in the time period 1870 to 1929. They believe that there is significant long-term relationship between financial strength indicators and the level of capital output. In the same time, result from Granger Causality test shows that financial intermediaries paly important role in promoting real economic activities.

Tadesse (1998) analyses data from 36 countries between 1980 and 1995 and conclude that bank-based financial system and market-based financial system play different roles in promoting economic growth. When the financial sector is underdeveloped, the bank-based financial system plays a greater role than the market-based financial system; and when the financial sector is developed, the market-based financial system plays a greater role than the bank-based financial system. This conclusion explains, to some extent, the analysis result that the causal relationship between financial development and economic growth is significant in some countries but is not in others.

In the above study, whether the empirical analysis is for cross-country panel data or time series data, inevitable bias exist due to the omission of some variables and potential simultaneity bias for building the simultaneous equations to describe the interacted relationship between various variables. Rousseau and Wachtel (2004) use a differencing panel estimator to eliminate bias from the country-specific unobserved heterogeneity and seek to eliminate the potential non-equilibrium in model parameters caused by simultaneity bias. On this basis, they use panel analytical techniques for annual data from 47 countries between 1980 and 1995 and conclude that banks and the stock market can both explain the development of economic growth to some extent.

Empirical evidence at meso-level

Although using various econometric analysis tools, studies on the macro level use cross-country data sets to analyse. However, Gregory and Mankiw (1995) pointed out that there are limitations in using cross county data sets for financial development and growth studies. Using meso-level data, or in other words, industry level data, research in this field carried out one step forward.

Rajan and Zingales (1998) explore the mechanism from financial development to economic growth through studying the interaction between a country's financial development level and the proxies of industry

growth. They believe that financial development reduces the cost of external financing for enterprises. The establishment of new enterprises not only indicates industry growth, but also means that innovation was promoted in certain extent. In this way, the economic growth was promoted as well.

And the level of financial development is one of the determinants for industry scale, composition, and concentration. Neusser and Kugler (1998) set up an indicator for financial deepening comprising all financial intermediaries' activities. They use multivariate time series estimation and Vector Autoregression (VAR) model to study the relationship between manufacture industry and financial development for stationary data covering 13 OECD countries for nearly 30 years. The results showed that the development of the financial sector not only associated with the manufacturing output but also the total factor productivity (TFP). More importantly, in four countries: the United States, Japan, Germany, and Australia, this relationship expresses a causality relationship pointing from the financial development to manufacturing industry development. That is, financial development is the cause of the development of the manufacturing sector.

A regression analysis conducted by Wurgler (2000) for 65 countries' manufacturing industry between 1963 and 1995 on the total investment and value-added production showed that because of the best investment assumption, investment on growing industry will increase rapidly and investment on declining industry will decrease. Thus, the capital allocation efficiency is improved by the development of financial markets.

Fisman and Love (2003) re-examined the inter-sectoral resources allocation role of financial markets in the whole society. They pointed out that if countries have a higher level of financial market development, industries will have interrelated higher growth rate.

Empirical evidence at micro-level

There are also many problems about research on meso-level. Doing econometric analysis on panel data using only regression analysis may result in large deviations in the research findings. However, the use of micro-level enterprise data for quantitative analysis can avoid and recognise these problems to some extent and thereby deepen the awareness of the promoting mechanism of financial development on economic growth.

Building on enterprise financial budget model, Demirguc-Kunt and Maksimovic (1998) use regression analysis to study the specific type of enterprises data in 30 countries from 1984 to 1991. They believe that the more perfect the legal system of the country, more enterprises will adopt long-term equity financing and long-term debt financing. An active stock market and a strong banking sector are related to the growth of the industry which has a strong dependence on external financing. After that, they did country subgroup comparison and found that in industrialized countries, the ratio of long-term debt is higher than business enterprises in developing countries. At the same time, large companies have higher debt ratio than smaller companies.

In order to investigate the impact of financial development for enterprises of different scale, Beck et al. (2005) analyse the data of 4000 enterprises (of which 80% are small and medium-sized enterprises (SMEs)) in the time period 1995 to 1999 from the World Business Environment Survey (WBES). They point out that due to the important role the development of SMEs play on promoting economic growth and eliminating poverty, by improving the level of financial development, judicial efficiency, and reducing the degree of corruption can help improving SMEs' financing environment, so as to promote economic growth and improve people's standard of living.

2.2 Bank, stock market, and urbanisation

2.2.1 Bank

Functions of the financial system

According to Levine (1997), the financial system has five key functions: 1) producing information about possible investment and allocating capital; 2) after providing financial support, monitoring the investment and exert the corporate governance; 3) managing the trading, diversification and risk; 4) mobilizing and pooling savings; 5) reducing the transaction costs like the exchange of goods and services.

Assessing the financial development

A good measurement of financial development is the prerequisite for assessing the development of the financial sector and understanding the role of financial development on the economic growth. In practice, however, measuring the vast concept of the financial development with several dimensions can be a difficult task. The existing empirical researches trying to assess the financial development are based on several standard quantitative proxies for a long time series and a wide range of country samples. For example, ratios of financial institutions' assets to GDP, ratio of liquid liabilities to GDP, and ratio of deposits to GDP. Nevertheless, the financial sector in a country contains various financial institutions, financial markets, and financial products. The measurements are only of rough estimation and cannot address the real wide term of financial development. The World Bank's Global Financial Development Database developed a comprehensive yet relatively simple conceptual 4*2 framework to measure financial development around the world. This framework identifies four sets of proxy variables characterizing a well-functioning financial system: financial depth, access, efficiency, and stability. These four dimensions are then measured for the two major components in the financial sector, namely the financial institutions and financial markets (Cihak, Demirguc-Kunt, Feyen, Levine, 2013).

Measurement of bank depth

As regards financial depth, the variable that has received much attention in the empirical literature on financial development is private credit to GDP. The proxy was also used by Levine and Zervos (1998), Beck, Levine, Loayza (2000), Beck and Levine (2004) and Demirguc-Kunt, Feyen, Levine (2011) and is considered to be a better measurement for the degree to which banks ease information and transaction costs as it can isolates bank credit to the private sector and therefore excludes credits by development banks and loans to the government and public enterprises. Many existing literatures use it as a proxy for the whole financial intermediaries development, Levine and Zervos (1998) and Levine (1998). However, it is arguable that the proxy cannot capture the development level of the whole financial intermediaries, but is a good proxy for the bank depth, which will be employed in this study.

2.2.2 Stock market

Levine and Zervos (1998) asked the question "do well-functioning stock markets and banks promote long-run economic growth?", after entered the stock market liquidity and banking development together in regressions, they found that these two elements both positively predict long-run economic growth, capital accumulation and productivity improvement, even after controlling for economic and political factors. The research emphasised a lot on the stock market liquidity.

Liquidity

Liquidity is a broad and elusive concept. It is defined as "the access to sufficient immediately spendable funds at reasonable cost exactly when those funds are needed" by Rose and Hudgins (2013). Drawing from Williamson's (2008) study, it relates to the ability of an economic agent to exchange their existing wealth. Liquidity risk arises when there are interactions between the funding and asset side of the balance sheet — no sufficient cash or assets that can be quickly liquidated and at less than fair market prices to repay

depositors' sudden surge in liability withdrawals (Bank of England, 2013; Rose & Hudgins, 2013, p183; Saunders & Cornett, 2014, p352; Mishkin & Eakins, 2015, p440). According to Machina & Rotschild (1987) and Nilolaou (2009), liquidity and liquidity risk have an inverse relationship. When liquidity risk is high, the probability of illiquidity becomes high, and this therefore leads to lower liquidity.

Liquidity risk takes on a number of forms; it is mainly divided into three types: central bank liquidity risk, market liquidity risk and funding liquidity risk. Nilolaou (2009) points out that market liquidity risk relates to the inability to trade an asset at short notice with low cost and little impact on its price. Fernandez (1999) suggests that "(market) liquidity, as Keynes (1930) noted incorporates key elements of volume, time and transaction costs. Liquidity then may be defined by three dimensions which incorporate these elements: depth, breadth (or tightness) and resiliency". A market is deep when a large number of transactions can occur with no price fluctuation, or when a large amount of orders lies in the order-books of market-makers at a given time. Markets can be regarded as tight when transaction prices do not diverge from mid-market prices. Resiliency here means that the changes in price from trades are quickly dissipated and imbalances in order flows are quickly adjusted (Nilolaou, 2009). Liu (2006) summarises these dimensions into "trading quantity, trading speed, trading cost and price impact". These ensure rapid asset selling at competitive prices within market hours with minimum loss of value (Nilolaou, 2009). As the monopoly provider of liquidity, the central bank, i.e. the originator of the monetary base, can dispense liquidity when needed according to its policy stance. It can only be illiquid when there is no demand for domestic currency, and therefore the supply of base money from the central bank can not materialize. This could happen in cases of hyperinflation or an exchange rate crisis (Nilolaou, 2009). The corporate treasurer would consider funding liquidity risk as a chief concern all the time: can we pay our bills, can we fund our liabilities? In terms of funding liquidity, the IMF describes it as "the ability of solvent institutions to make agreed upon payments in a timely fashion" (IMF, 2008, p14). The Basel Committee of Banking Supervision defines it as the ability of banks to meet their liabilities, unwind or settle their positions as they come due (BCBS, 2008, p2). Borio (2000), Strahan (2008), and Brunnermeier and Pedersen (2007) agree that funding liquidity is the ability to raise cash at short notice either via asset sales or new borrowing. A classic indicator of funding liquidity is the current ratio, defined as the speculator's scarcity of capital (Brunnermeier and Pedersen, 2008). Drehmann, Elliot and Kapadia (2007) point out that funding liquidity relates to flows. Similarly, Drehmann and Nilolaou (2009) believe that a bank is liquid, able to satisfy the demand of money, as long as the outflows of money are smaller or equal to inflows and the stock of money held by the bank at each point in time. $\text{Inflows}_t + \text{Stock of Money}_t \geq \text{Outflows}_t$

Liquidity risks can arise from both the liability and asset sides. The liability-side reason happens when depositors or policyholders cash in claims. With low cash holdings, financial institutions may be forced to liquidate assets too rapidly. They need to borrow additional funds or sale assets to meet the withdrawal; the price the assets holder must accept for immediate sale may be far less than it would receive with a longer horizon (also known as fire-sale price), which can threaten the solvency of banks. The asset-side reason occurs because of off balance sheet loan commitments, which allow customers to borrow (take down) funds on demand over a commitment period. Liquidity requirements from take down of funds can be met by running down cash assets, selling other liquid assets, or additional borrowing (Saunders & Cornett, 2014, p352).

Stock Market and growth

As a major objective in the big finance market, stock market is the place where companies and individual can seek investing capital support and is playing an important role in influencing the overall macroeconomic elements.

Although stock market was linked with the economic growth in the recent literature (example), as one aspect of the economic growth and one important development indicator in the globalization, industrialization trending world, urbanization have not attracted much attention in the empirical research.

Urbanisation, measured as urban population to total population, was used as a controlled variable in the economic growth regression. In this basis hypothesis framework, how stock market relates to the urbanization development? The main stream in how finance development research area indicates that finance can influence urban-rural income gap in three different ways which are through the non-equilibrium effect, threshold effect and poverty reduction effect (Zhang, Kan, 2006).

Financial Crisis & Changes

Liquidity at banks dried up during the financial crisis of 2007-2009, the biggest shock to the banking system since the 1930s, as a result of both interbank markets froze and markets for asset-backed and mortgage-backed securities collapsed. It raised fundamental questions about liquidity risk (Strahan, 2012). Counterparties, short-term creditors, existing borrowers etc. urgently demand for cash which result in credit fell and liquidity shock on banks. Illiquidity peaked in the fourth quarter of 2008 after the failure of Lehman Brothers and the AIG bailout. The Fed first attempted to stabilize the financial system with traditional tools of monetary policy, then expanded their balance sheet by more than $1 trillion over a few weeks, and later implemented new techniques such as equity injections and extensions of liability guarantees. Central bank emergency lending programs mitigated the decline in some extent. In order to strengthen the financial system by making credit less vulnerable to liquidity shocks, efforts were made to regulate bank liquidity.

Empirical study (Cornett, McNutt, Strahan & Tehranian, 2011) found banks with more illiquid asset portfolios (held more loans and securitized assets) increased their holdings of liquid assets and decreased lending. Besides, banks that relied more heavily on stable sources of financing (core deposits and capital) continued to lend relative to other banks. Off-balance sheet liquidity risk, in the form of undrawn loan commitments, materialized as borrowers drew on pre-existing commitments in large quantities. These takedowns displaced lending capacity and constrained new credit origination. When they aggregate the results up, most of the decline in bank credit production during the height of the crisis can be explained by liquidity exposure.

Focusing on aggregate liquidity tells what Federal Reserve is doing (Keister & McAndrews 2009). In contrast, Cornett et al. (2011) study the variations on cash and other liquid assets holding, provision of credit among banks which helps understand different strategies of banks during the crisis.

Banks tend to increase the liquid assets holding and reduce new lending when they are in high liquidity risk conditions. Liquidity exposure can influence banks' behaviour in several aspects. In asset dimension, worrying about financing securitized assets during the crisis, banks with low liquidity securities (e.g., mortgage-backed securities), would hoard liquidity to the detriment of borrowers by increasing cash buffers and cutting new lending to protect themselves. In liability dimension, new lending will reduce significantly in banks that relied more on wholesale sources of funding compares with those on traditional deposits and equity capital. Cornett et al. (2011) estimate how banks managed sudden rises in loan demand during the crisis result from off-balance-sheet loan commitments. Having higher levels of pre-existing commitments, banks hoard liquidity and cut new credit origination which allows loan commitment drawdowns to displace new credit origination during the crisis.

2.2.3 Urbanisation

The world urbanisation process is accelerating nowadays. The urbanisation development is affected by a variety of factors and the level of the economic development which results in a large variance in the urbanisation process in the world. However, the level of urbanisation will also affect the speed of the development in many aspects of a country. This made the process of urbanisation becomes a common concern for all countries in the world. Urbanisation is an inevitable phenomenon in the development of society's productivity, and it is the inevitable result of the development of market economy and the change of industrial structure. The history of the economic development in the world shows that urbanisation is an effective integrated method in the process of modernisation. Therefore, to explore the mechanism of the urbanisation process, find out the reasons of the different level of urbanisation, is crucial for promoting the sustained economic growth.

Urbanisation is a population shift from rural to urban areas, "the gradual increase in the proportion of people living in urban areas", and the ways in which each society adapts to the change. It is predominantly the process by which towns and cities are formed and become larger as more people begin living and working in central areas.

According to the World Urbanization Prospects (2014), today, more people live in urban areas than in rural areas in the world. According to the data, 54 percent of the world's population l in urban areas in 2014 while in 1950, 30 percent of the world population was urban. The most urbanized regions today include Northern America (82 percent living in urban areas in 2014), Latin America and the Caribbean (80 percent), and the Europe (73 percent). In contrast, Africa and Asia remain mostly rural, with 40 and 48 per cent of their respective populations living in urban areas.

The urban population of the world has grown rapidly since 1950, from 746 million to 3.9 billion in 2014. Asia, despite its lower level of urbanization, is home to 53 percent of the world's urban population, followed by Europe (14 percent) and Latin America and the Caribbean (13 percent).

Although the world today is increasingly global and interconnected with over half of the population (54 percent) lives in urban areas, substantial variability still exist across economies in the level of urbanization. For example, economies like Singapore, Hong Kong SAR (China), Macao SAR (China), Gibraltar, has all their population living in urban areas in 2014, in other words, the urban population proportion in these economies/areas are 100%. However, it is notable that economies with a 100% urban population are always island and very small in territory size.

On the other hand, in 2014, Africa countries like Burundi (12%), Uganda (16%), Malawi (16%), Ethiopia (19%), South Sudan(19%), Niger (18%), Asia countries like Nepal (18%), Sri Lanka (18%), European county Liechtenstein (14%) has extremely low proportion of urban population. It is notable that most countries above have very difficult geographic natural conditions. For statistical purposes, the data for China do not include Hong Kong and Macao, Special Administrative Regions (SAR) of China. As of 1 July 1997, Hong Kong became a Special Administrative Region (SAR) of China. And in 20 December 1999, Macao became a Special Administrative Region (SAR) of China.

The coming decades will bring further profound changes to the size and spatial distribution of the global population. Along with fast growth of the world urbanization level, the number of mega-cities has nearly tripled since 1990. Several decades ago, most of the world's largest urban agglomerations were found in the more developed regions, today's large cities are concentrated in the global South, and the fastest-growing agglomerations are medium sized cities and cities with 500,000 to 1 million inhabitants located in Asia and Africa.

Levels of urbanization vary greatly across region

In 2014, high levels of urbanization, at or above 80 percent, characterized Latin America and the Caribbean and Northern America. Europe, with 73 percent of its population living in urban areas, is expected to be over 80 percent urban by 2050 according to the prediction from World Urbanization Prospects (2014).

Africa and Asia, in contrast, remain mostly rural, with 40 percent and 48 percent of their respective populations living in urban areas. Over the coming decades, the level of urbanization is expected to increase in all regions (also referred to as major areas), with Africa and Asia urbanizing faster than the rest. Nevertheless, these two regions, which are projected to reach 56 and 64 percent urban by mid-century, respectively, are still expected to be less urbanized than other regions of the world.

Africa and Asia are urbanizing more rapidly than other regions of the world. The rate of urbanization, measured as the average annual rate of change of the percentage urban, is highest in Asia and Africa, where currently the proportion urban is increasing by 1.5 and 1.1 percent per annum, respectively. Regions that already have relatively high levels of urbanization are urbanizing at a slower pace, at less than 0.4 percent annually. In general, the pace of urbanization tends to slow down as a population becomes more urbanized.

Urbanization in developing countries has proceeded faster than in developed countries, but the correlation of the rate of urbanization with economic growth has been weaker than in developed countries (United Nations, 2013b).

The rural population has grown slowly since 1950 and is expected to reach its peak

The rural population of the world has grown slowly since 1950 and is expected to reach its peak in a few years according to the prediction in World Urbanization Prospects (2014). Approximately 3.4 billion people currently live in rural areas around the world. That number is expected to remain relatively constant in the coming years. However, sometime after 2020, the world's rural population will start to decline and is expected to reach 3.2 billion in 2050. This global trend is driven mostly by the dynamics of rural population growth in Africa and Asia, which is home today to nearly 90 percent of the world's rural population. The rural population of the world resides in a relatively small number of countries. India has the largest rural population (857 million), followed by China (635 million). Together, these two countries account for 45 percent of the world's rural population.

Just a few countries are home to half of the world's urban population

China has the largest urban population (758 million), followed by India (410 million). These two countries account for 30 percent of the world urban population and , with another five countries, the United States of America (263 million), Brazil (173 million), Indonesia (134 million), Japan (118 million), and the Russian Federation (105 million), account for more than half of the world's urban population. Future increases in the world's urban population are also expected to be highly concentrated in just a few countries.

2.3 Linkages

The world urbanisation process is accelerating nowadays. The urbanisation development is affected by a variety of factors and the level of the economic development which results in a large variance in the urbanisation process in the world. However, the level of urbanisation will also affect the speed of the development in many aspects of a country. This made the process of urbanisation becomes a common concern for all countries in the world. Urbanisation is an inevitable phenomenon in the development of society's productivity, and it is the inevitable result of the development of market economy and the change of industrial structure. The history of the economic development in the world shows that urbanisation is an effective integrated method in the process of modernisation. Therefore, to explore the mechanism of the

urbanisation process, find out the reasons of the different level of urbanisation, is crucial for promoting the sustained economic growth.

Rather than finance, the growth aspect in the finance growth nexus is a much historical and wider element which related to nearly all the economic activities. Nowadays, the urbanisation issue has attracted attention because of its great significance to the harmonious development of the economy and the society. Research has been done on correlations between elements like financial development, income gap, country's openness (Baltagi, Demetriades and Siong, 2009), technology improvement, customer demand (Panda and Tapan, 2003), foreigh direct investment (Carkovic, 2002), trade credit and industry growth (Fisman, Love, 2003), currency rate changes, currency demand, and insightful results and fingings were generated after related these macroeconomnic elements together.

Although stock market was linked with the economic growth in the recent literature (example), as one aspect of the economic growth and one important development indicator in the globalization, industrialization trending world, urbanization have not attracted much attention in the empirical research.

Urbanisation, measured as urban population to total population, was used as a controlled variable in the economic growth regression. In this basis hypothesis framework, how stock market relates to the urbanization development? The main stream in how finance development research area indicates that finance can influence urban-rural income gap in three different ways which are through the non-equilibrium effect, threshold effect and poverty reduction effect (Zhang, Kan, 2006).

Apart from the historical focus on banking, the links between stock markets and long-run growth are also become an expanding important part of the literature. Levine (1991), Bencivenga and Smith (1991), and Ross M. Star (1995) built models to study the links between stock markets and the long run growth. In the model specification, the stock market is considered to be more liquid if it is cheaper to trade equities. This is because that lower price of trading equities can help reducing the costs of long run investment such as investment on long duration projects. Benefit from the liquidity in the market, investors are able to sell the equities in short time period before the maturity when is it required. In this case, high liquidity level can help operating long run investment and therefore leads to higher return investment and long run growth.

In the same time, Maurice Obstfeld (1994) and Michael B. Devereux and Gregor W. Smith (1994) suggested that internationally integrated stock market makes the international risk-sharing become greater than before. This can induce institutions' investing portfolio transforming from safe and low-return equity to high-return one. The risk taking behavior will help promoting the productivity growth. However, debate about whether it indeed can promote the transformation also exists. Seeing from other aspects, these influencing factors also show that greater liquidity and international stock market will affect the saving rates. But if the saving rates start to fall under the influence, it will slow down the overall growth of the internationally integrated financial markets.

Because selling shares can be achieved easier under more liquid markets, some researchers argue that more liquidity can decrease the shareholders incentives to take the task of monitoring managers which is costly (Andrei Shleifer and Robert W.Vishny 1986, Amar Bhide 1993). On the other hand, lack of corporate governance can influence effectively allocating resources and thus slow down the overall productivity growth.

From the above discussion, it is obvious to see that theoretical debate about the links between growth and finance's function still have not come to an agreement.

3. Methodology

3.1 Data

This study makes use of data from various sources. A large strongly balanced panel data set of 43 economies that covers the period from 1990 to 2014 were selected to analyse in this study.

Most of the financial data comes from the Global Financial Development Database. This new database was constucted by Cihak, Demirguc-Kunt, Feyen and Levine in 2013 covers 205 economies from 1960 to 2010 for 51 years about the financial systemss around the world. They created a 4*2 matrix of measurement for (1)size, (2)access, (3)efficiency, and (4)stability for both financial institutions and markets. (here, access means degree to which individuals and firms can and do use financial services; efficiency means efficiency of financial intermediaries and markets in intermediating resouces and facilitating financial transactions) The dataset highlights the multi-dimensional nature of financial systems. Deep finanical systems do not necessarily provide high degrees of financial access; highly efficient financial systems do not necessarily more stable than the less efficient ones, and so on. Their study and the underlying datasets illustrates that finanical systems come in different shapes and sizes, and they differ widely in terms of the 4*2 matrix of characteristics (Cihak, Demirguc-Kunt, Feyen, Levine, 2013). Data for macroeconomic variables come from the World Development Indicators (Revisions of 2016) gathered through the World Bank Data website. Data for the education proxy measured by average years of shcooling for adults over 25 year old was derived from Barro and Lee (2010) 's dataset (latest 2016 version), named Educational Attainment for Total Population, 1950-2010.

3.1.1 Economies groups

Covering 6 continents of Asia, Africa, North America, South America, Europe and Australia, the economies sample has 22 developing economies and 21 advanced economies according to the International Monetary Fund (IMF)'s World Economic Outlook Report, April 2016.

Table 1. Geographic Region of the Sample Economies

Africa	***Asia***	***North America***	***Europe***
Morocco	Indonesia	United States	Turkey
Nigeria	India	Mexico	Austria
Mauritius	Sri Lanka	Canada	Switzerland
South Africa	Hong Kong (China)*		Germany
	Saudi Arabia	***South America***	Denmark
Australia	Israel	Argentina	Spain
Australia	Japan	Brazil	Finland
New Zealand	Philippines	Chile	France
	China	Jamaica	United Kingdom
	Jordan	Peru	Greece
	Malaysia		Hungary
	Thailand		Netherlands
	South Korea		Norway
			Poland
			Portugal
			Sweden

Table 2. Development Level of the Sample Economies

Advanced economies	**Developing economies**
Australia	Argentina
Austria	Brazil
Canada	Chile
Denmark	China
Finland	Hungary
France	India
Germany	Indonesia
Greece	Jamaica
Hong Kong(China)	Jordan
Israel	Malaysia
Japan	Mauritius
Netherlands	Mexico
New Zealand	Morocco
Norway	Nigeria
Portugal	Peru
South Korea	Philippines
Switzerland	Poland
Sweden	Saudi Arabia
Spain	South Africa
United States	Sri Lanka
United Kingdom	Thailand
	Turkey

Meanwhile, according to the World Bank gross national income (GNI) per capita classification, economies are classified as low income, middle income (subdivided into lower middle and upper middle), or high income. Economies are divided according to 2015 gross national income (GNI) per capita, calculated using the World Bank Atlas method. For the current 2017 fiscal year, low-income economies are defined as those with a GNI per capita of $1,025 or less in 2015; middle-income economies are those with a GNI per capita of more than $1,025 but less than $12,7475; high-income economies are those with a GNI per capita of $12,475 or more. Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of $4,035. In this study, the sample economies cover 6 lower middle income economies, 13 upper middle income economies and 24 higher income economies (2 OECD members and 22 non-OECD members).

Table 3. World Bank Analytical Classifications: GNI per capita in US$ (Atlas methodology)

Income Group	**Bank's fiscal year:2017 calendar year :2015 Classification (US$)**
Low income economies	<= 1,025
Lower middle income economies	1,026-4,035
Upper middle income economies	4,036-12,475
High income economies	> 12,475

Table 4. Income group of the Sample Economies

Lower middle income economies	Upper middle income economies	High income economies		
Indonesia	Argentina	Non OECD	OECD members	
India	Brazil	Hong Kong(China)	Australia	Hungary
Sri Lanka	Chile	Saudi Arabia	Austria	Israel
Morocco	China		Canada	Japan
Nigeria	Jamaica		Switzerland	South Korea
Philippines	Jordan		Germany	Netherlands
	Mexico		Denmark	Norway
	Mauritius		Spain	New Zealand
	Malaysia		Finland	Poland
	Peru		France	Portugal
	Thailand		United Kingdom	Sweden
	Turkey		Greece	United States
	South Africa			

3.1.2 Panel Data

The data used in this study is a large strongly balanced panel dataset. However, why use panel techniques instead of others? The reason is that moving to a panel from pure cross-sectional data allows the study to exploit the time-series dimension of the data and deal rigorously with simultaneity (Beck and Levine, 2004). Levine, Loayza and Beck (2000), and Beck, Levine and Loayza (2000) use a panel GMM estimator that improves upon pure cross-country work (Arellano and Bond, 1991). Panel data sets provide more information, more variability, less collinearity among variables, more observations and hence higher precision of estimates. It allows the ability to model temporal effects without aggregation bias. Time series data usually tend to be aggregates of heterogeneous information across individuals (e.g. the total income in a household could be the sum of the incomes of a couple with vastly different salaries). Such aggregate income introduces the problem of aggregation bias in the time series, in the sense that aggregate behaviour does not accurately represent behaviour at the micro level. Panel data sets are ideal in the study of dynamics or change because they follow the same individual units through time. It also allows models that account for unobserved heterogeneity. Panel data estimators allow us to capture certain unobservable individual effect which is not normally possible with cross-section data. They allow us to control for variables we cannot observe or measure known as individual heterogeneity.

Particularly, there are three advantages for moving to a panel. The first benefit from moving to a panel is the ability to exploit the time-series and cross-sectional variation in the data. Levine, Loayza and Beck (2000) construct a panel that consists of data for 77 countries over the period 1960 to 1995. The data are averaged over seven non-overlapping five-year periods. Moving to a panel incorporates the variability of the time-series dimension. The second benefit from moving to a panel is that it avoids biases associated with cross-country regressions. With cross-country regressions, the unobserved country-specific effect is part of the error term so that the correlation between the errors and the explanatory variables results in biased coefficient estimates. The third benefit from moving to a panel is that it permits the use of instrumental variables for all regressors and thereby provides more previse estimates of the finance-growth relationship. As discussed, researchers use legal origin instruments to extract the exogenous component of financial development. These pure cross-sectional estimators, however, do not control for the endogeneity of all the other explanatory variables. This can lead to inappropriate inferences on the coefficient on financial development. Building on this difference panel estimator, Arellano and Bover (1995) propose a

system estimator that jointly estimates the regression in levels and the equation in differences in order to re-incorporate the cross-country variation from the levels regression and reduce the likelihood that weak instruments bias the estimated coefficients and standard errors.

3.1.3 Data Overview

The three targeted researching elements are bank depth, stock market liquidity, and urbanisation development. Various summarise statistics show that the relationship between these three is positive.

By looking at the correlation matrix among them can give a basic overview of the simple relationship among them. It is clear that bank depth, stock market liquidity, and urbanisation are positively correlated with each other, among which the positive relationship between bank depth and urbanisation is the strongest while the positive relationship between stock market liquidity and urbanisation development is relatively low. By looking at the mean, median, maximum, and minimum value of the targeted researching variables can greatly help understanding the variations across the sample individuals and the sample time periods. Below is a summary statistics table for the three dependent variables bank depth, stock market liquidity, and urbanisation with the value of mean, median, maximum, and minimum across the 25 years' time period. Further, the scatter graphs provide a visual and intuitive look of how they variables move together. A slightly positive relationship is showing in the graph among bank depth, stock market liquidity, and urbanisation.

To sum up, 1) the correlation matrix; 2) mean, median, maximum, minimum values of the dependent variable over the years, and 3) scatter graphs, all indicate a positive interaction among the bank depth, stock market liquidity, and urbanisation. However, only by looking at these statistics cannot help understand the inter-correlation among these economic terms. Further regression analysis is needed in this case.

Table 5: Correlation Matrix

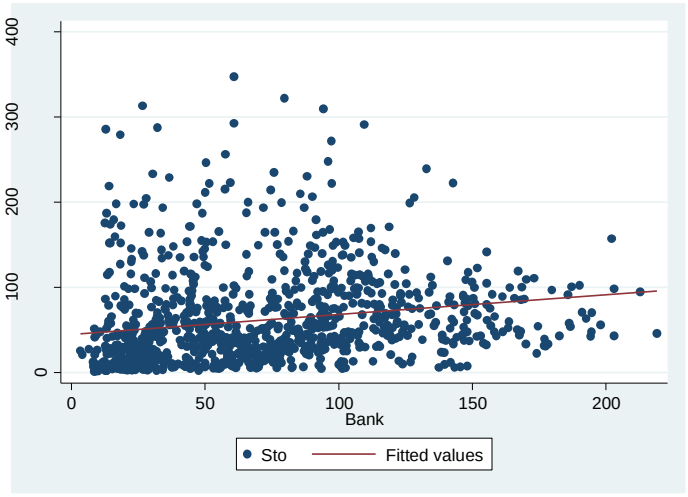
	bank	sto	urban
bank	1		
sto	0.1880	1	
	(0.0000)		
urban	0.3278	0.1316	1
	(0.0000)	(0.0000)	

Table 6. Summary Statistics: 1990-2014 (Mean, Median, Max, and Min)

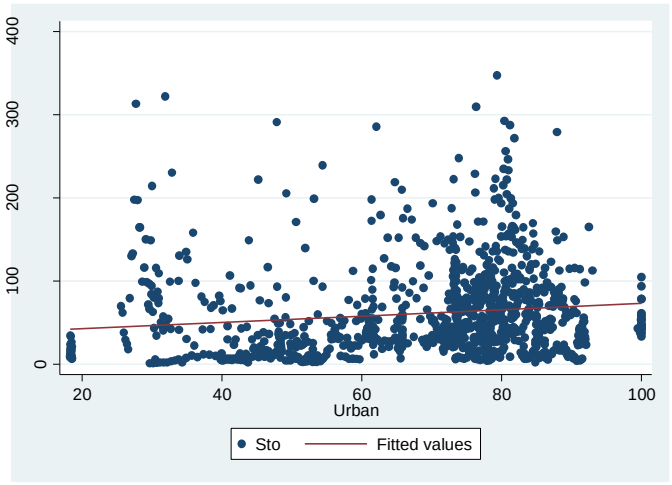
year		bank	sto	urban
1990	Mean	54.86039	45.26888	64.72349
	Median	50.18683	33.6879	71.956
	Max	167.5993	222.2583	99.517
	Min	3.289649	.9061127	18.566
1991	Mean	55.03587	34.96743	65.07391
	Median	48.00355	29.82576	72.265
	Max	170.122	121.241	99.832
	Min	4.088884	.6242069	18.553
1992	Mean	55.46188	42.35605	65.4124
	Median	49.2136	31.84161	72.665
	Max	174.2172	164.7594	99.979
	Min	6.470694	1.056617	18.541
1993	Mean	56.80367	55.29124	65.74272

	Median	44.76035	40.57817	73.061
	Max	178.5503	228.6205	100
	Min	8.567793	1.633423	18.529
1994	Mean	56.97695	57.81994	66.06842
	Median	47.34364	37.19765	73.343
	Max	176.9919	279.0063	100
	Min	9.608808	1.867357	18.516
1995	Mean	58.24756	45.54184	66.3727
	Median	48.93628	39.88023	73.368
	Max	177.5525	285.9349	100
	Min	9.392721	1.718335	18.504
1996	Mean	60.47189	48.82196	66.654
	Median	51.20621	38.90897	73.64
	Max	177.1172	322.1203	100
	Min	8.801556	1.584096	18.492
1997	Mean	63.56778	60.43772	66.93095
	Median	53.52537	43.37111	73.929
	Max	182.6767	230.3293	100
	Min	10.19433	3.887355	18.48
1998	Mean	65.0023	65.60816	67.20226
	Median	51.4695	53.71439	74.186
	Max	194.7247	222.8363	100
	Min	12.5818	2.542124	18.467
1999	Mean	64.91873	65.18048	67.48863
	Median	52.73319	53.35098	74.441
	Max	198.0947	347.566	100
	Min	12.95813	1.729022	18.455
2000	Mean	67.58684	74.40183	67.78707
	Median	61.57034	56.2394	74.722
	Max	192.6708	313.1811	100
	Min	11.32658	2.601362	18.443
2001	Mean	69.24148	64.26969	68.11758
	Median	67.05014	44.79182	75.045
	Max	151.8728	309.804	100
	Min	14.38454	3.089593	18.431
2002	Mean	69.15287	56.14881	68.47979
	Median	71.72506	44.6786	75.365
	Max	149.059	234.8246	100
	Min	12.54013	2.937304	18.418
2003	Mean	69.70117	57.191	68.83067
	Median	69.45275	43.57861	75.682
	Max	147.3489	187.2444	100
	Min	11.59516	3.802438	18.406
2004	Mean	70.10106	60.71349	69.17395
	Median	68.85653	47.62295	75.997
	Max	148.214	204.3799	100
	Min	8.026657	4.366716	18.394
2005	Mean	72.48013	65.5017	69.52295
	Median	75.06848	52.12949	76.308
	Max	157.5012	233.1254	100
	Min	8.248255	3.148837	18.382
2006	Mean	75.29889	74.73853	69.86672
	Median	79.69122	59.22345	76.617

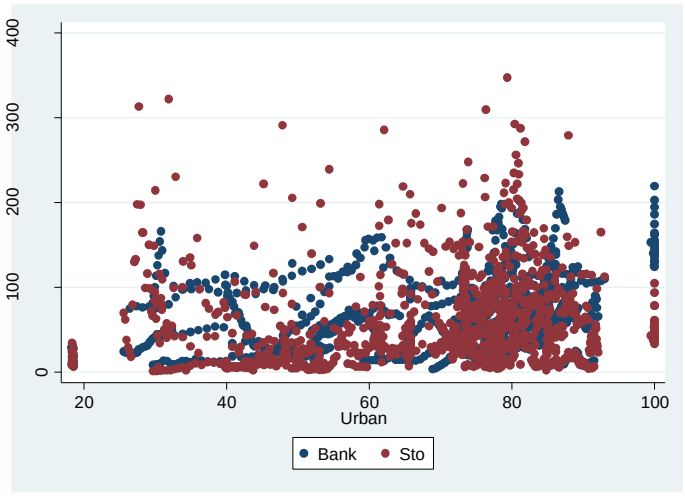
	Max	169.5499	287.624	100
	Min	8.857579	2.384384	18.37
2007	Mean	78.00705	86.57831	70.20423
	Median	80.13029	83.995	76.923
	Max	185.8665	222.0457	100
	Min	9.524114	2.987192	18.357
2008	Mean	83.14818	79.20388	70.53767
	Median	82.89135	71.32693	77.227
	Max	203.1224	292.6155	100
	Min	9.698883	3.584328	18.345
2009	Mean	86.52539	84.22556	70.86616
	Median	86.20232	76.88367	77.527
	Max	212.9003	290.9728	100
	Min	10.11894	2.035009	18.333
2010	Mean	84.23501	66.46233	71.19109
	Median	84.86749	59.88467	77.825
	Max	194.8826	222.2471	100
	Min	9.7793	3.239812	18.321
2011	Mean	83.97133	63.88152	71.5124
	Median	85.3183	57.12181	78.118
	Max	191.2122	246.3157	100
	Min	10.8018	4.716554	18.309
2012	Mean	84.86496	55.98846	71.82867
	Median	79.40964	52.15249	78.407
	Max	194.369	187.0977	100
	Min	11.54099	3.073192	18.297
2013	Mean	85.55421	53.92019	72.14028
	Median	77.31998	40.44366	78.691
	Max	203.0774	198.8638	100
	Min	11.57437	3.48441	18.3
2014	Mean	86.17574	55.19604	72.44719
	Median	77.62629	44.82312	78.971
	Max	219.107	239.0372	100
	Min	12.89466	4.116252	18.32
Total	Mean	70.09396	61.01889	68.56704
	Median	64.44875	44.90257	74.644
	Max	219.107	347.566	100
	Min	3.289649	.6242069	18.297



Graph 1. Bank Depth and Stock Market Liquidity



Graph 2. Urbanisation and Stock Market Liquidity



Graph 3. Urbanisation, Bank Depth, and Stock Market Liquidity

3.2 Variables

Three endogenous variables, also are the dependent variables are used in the model. They are BANK (bank depth), STO (stock market liquidity), and URAN (urbanisation). In the same time, 24 exogenous variables are employed in the model across the equations' specifications, including the three lagged value of the dependent variables.

The construction of the variables to capture financial development is a difficult task due to a number of reasons. Financial services are provided by a wide range of financial institutions and agents. Among them, banks and stock markets both play a major role. In order to capture a complete picture, different aspects of financial development need to be considered. For instance, whether the financial sectors of the studied countries are dominated by banks or the stock market or both. However, our prime objective is to investigate the long-run relationships. Therefore, we use bank-based financial proxies due to the unavailability of long-span time series data for the stock market for many countries.

Bank depth

To measure "bank depth", proxy BANK, which equals deposit money bank credit to the domestic private sector as a share of Gross Domestic Product (GDP), is used in this study. Also commonly called Private Credit, this proxy isolates credit issued to the private sector and therefore excludes credit issued to governments, government agencies, and public enterprises. Private credit also excluded credits issued by central banks. This proxy was also used by Levine and Zervos (1998), Beck, Levine, Loayza (2000), Beck and Levine (2004) and is preferred measure of also Demirguc-Kunt, Feyen, Levine (2011).

Although bank credit does not directly measure the degree to which banks ease information and transaction costs, bank credit improves upon alternative measures. First, unlike many studies of finance and growth that use the ratio of M3 to GDP as an empirical proxy of financial development, the bank credit variable isolates bank credit to the private sector and therefore excludes credits by development banks and loans to the government and public enterprises. As regards financial depth, the variable that has received much attention in the empirical literature on financial development is private credit to GDP. Private credit to GDP differs widely across countries, and it correlates strongly with income level. Financial depth, approximated by private credit to GDP, has a strong statistical link to long-term economic growth; it is also closely linked to poverty reduction (Demirguc-Kunt and Levine 2008). However, it is notable that Cihak, Demirguc-Kunt, Feyen, Levine (2013) pointed that a high ratio of private sector credit to GDP is not necessarily a good thing. Indeed, all the 9 countries with the highest ratios of private sector credit to GDP as of 2010 had a banking crisis episode since 2008.

Unlike many past measures (King and Levine, 1993a, b), this measure excluded credits issued by the central bank and development banks. King and Levine (1993a, b) use a measure of gross claims on the private sector divided by GDP. But, this measure includes credits issued by the monetary authority and government agencies, whereas Private Credit includes only credits issued by deposit money banks and other financial intermediaries. Furthermore, it excludes credit to the public sector and cross claims of one group of intermediaries on another. Private Credit is also a broader measure of financial intermediary development than that used by Levine and Zervos (1998) and Levine (1998), since it includes all financial institutions, not only deposits money banks. Although M3/GDP shows the amount of liquid liabilities of the financial system, including the liabilities of banks, central banks and other financial intermediaries that reflects financial deepening, which is positively related with financial services, King and Levine (1993); Demetriades and Hussein (1996); Favara (2003). Nevertheless, Fry (1997) and Ang and McKibbin (2007) among others indicate that monetary aggregates are not good enough as proxies for financial development since they reflect the extent of transaction services provided by the financial system rather than the ability of the

financial system to channel funds from depositors to investors. Therefore, credit to the private sector as a proportion of GDP is the third most widely used alternative measure of financial development. It is often argued that credit to the private sector is a better proxy of financial development (see Demetriades and Hussein, 1996; King and Levine, 1993a; Beck et al, 2000; Favara, 2003; Liang and Teng, 2006; Arcand et al., 2011). The importance of this measure rests in the fact that it only accounts for credit granted to the private sector that enables the utilization of funds and their allocation to more efficient and productive activities. It also excludes credit issued by the central bank and thus is a more accurate measure of the savings that financial intermediaries channel to the private sector.

Not surprisingly, there is enormous cross-country variation in BANK. For example, in 1990, Japan, Hong Kong, Switzerland and the United Kingdom had a ratio over 100 for the Private credit indicator. In the same year, Argentina, Nigeria and Peru scored lower than 10. The first country in the ranking, Japan, with 167.6, was nearly 51 times higher than Peru, with 3.29 for the Private credit indicator. Situations changed dramatically after 25 years. In 2014, 16 economies had a Private credit value higher than 100, they are Hong Kong, Denmark, Switzerland, the United Kingdom, South Korea, Portugal, Spain, China, Sweden, Australia, Greece, Malaysia, Netherland, Thailand, Japan and Mauritius, among which, Hong Kong scored the highest for 219.1. Values lower than 10 already are not existed anymore and Argentina (12.97) and Nigeria (12.89) were the only two countries who scored lower than 20 in 2014.

Stock market liquidity

The stock market turnover ratio equals the total value of shares traded on a country's domestic stock exchanges divided by stock market capitalization (the value of listed shares on the country's exchanges). The turnover ratio is not a direct measure of trading costs or of the ability to sell securities at posted prices. Rather, the turnover ratio measures trading relative to the size of the market. It therefore reflects trading frictions and information that induces transactions. This ratio exhibits substantial cross-country variability. It was used by Levine and Zervos (1998a), Beck and Levine (2004) for a panel empirical estimation.

The logic of using this variable is that higher turnover means more liquidity, which in turn allows the market to be more efficient. Liquidity is the ease and speed at which economic agents can buy and sell securities. With a liquid market, the initial investors do not lose access to their savings for the duration of the investment project because they can easily, quickly, and cheaply, sell their stake in the company. Thus, more liquid markets could ease investment in long term, potentially more profitable projects, thereby improving the allocation of capital and enhancing prospects for long term growth. The more liquid the stock market, the larger the amount of savings that are channelled through the stock market. Therefore, a more liquid stock market is expected to lead to higher stock market development (Levine and Zervos, 1998).

Very active markets such as China, Turkey and the United States had turnover ratios of 239.04, 187.37 and 152.97 respectively in 2014, while less liquid markets, such as Peru, had turnover ratio of 4.12 in 2014. Some models predict countries with illiquid markets will create disincentives to long-run investments because it is comparatively difficult to sell one's stake in the firm. In contrast, more liquid stock markets reduce disincentives to long run investment, since liquid markets provide a ready exit option for investors. This can foster more efficient resource allocation and faster growth (Levine, 1991; Bencivenga et al., 1995).

Financial intermediaries stability (Finance)

Liquid liabilities to GDP which is defined as currency plus demand and interest bearing liabilities of bank and non-bank financial intermediaries divided by GDP (M3/GDP), is the broadest measure of financial depth used, since it includes all types of financial institutions (central bank, deposit money banks, and other financial institutions).

Theory focuses on the role that stock markets and banks may play in reducing informational asymmetries and lowering transactions costs. However, direct measures of the degree to which markets and banks in a broad cross-section of economies ameliorate information and transaction costs are beyond the knowledge. Consequently, while recognizing the absence of a direct link between theory and measurement, proxy measures of banking system size and stock market activity to gauge cross-country differences in stock market and bank development were used in the study.

However, debate about whether to use M3 or M2 to calculate this proxy also have not come to an agreement. Most of the empirical literature on this topic uses monetary aggregates such as M2 and M3 as a ratio of nominal GDP to capture the overall size and depth of the financial sector. However, some researchers such as Khan and Senhadji (2003) argue that M2/GDP might be a poor proxy for financial development in the case of countries with underdeveloped financial systems for two reasons. First, high level of monetization might be linked to financial underdevelopment and vice versa. Second, M2 mostly captures the ability of the financial system to provide transaction services rather than its ability to link up surplus and deficit agents in the economy. Several papers including Beck et al (2000); Favara (2003) and Deidda and Fattouh (2002) suggest to employ M3/GDP, which is a less liquid monetary aggregate, as a proxy for financial development. Therefore, in this paper we use the M3, as a proportion of GDP.

Other measures of stock market development like Value and Market Capitalization were used by Levine and Zervos (1998) and Rousseau and Wachtel (2000).

Stock market value (Value)

Value, calculated by the total value of domestic stocks traded on domestic exchanges as a share of GDP, measures trading relative to the size of the economy. Levine and Zervos (1998a) used it as the additional measure of liquidity

In the recent study of Demirguc-Kunt, Feyen, Levine (2011), Value was used to measure 'stock market development'. This indicator incorporates information on the size and activity of the stock market, not simply on the value of listed shares.

There is substantial variation across countries. In 1990, while the average ratio was 16.82% among the sample economies, Switzerland traded 173.05% stock market value to their GDP but Brazil, Argentina, Sri Lanka, Peru, Morocco and Nigeria traded lower than 1%. In 2014, four economies, Hong Kong, the United States, Japan and Switzerland, traded higher than 100% in stock market value as a share of their GDP. Hong Kong and the United States, with a share of 465.28% and 209.74% respectively, reflect very active stock market and huge market size and activity. Meanwhile, Jamaica and Argentina traded 0.68% and 0.61% in the same year.

Value has two potential pitfalls. First, it does not measure the liquidity of the market. It measures trading relative to the size of the economy. Second, since markets are forward looking, they will anticipate higher economic growth by higher share prices. Since value traded is the product of quantity and price, this indicator can raise without an increase in the number of transactions. Turnover ratio does not suffer from this shortcoming since both numerator and denominator contain the price (Beck and Levine, 2004).

Stock market efficiency (Cap)

There are two approaches to assess stock market capitalization, one is institutional and the other is macroeconomic. For a discussion of these two approaches to explain economic performance, see, for example, Olson, Jr. (1996).The institutional approach looks at institutional factors such as property rights, clearance and settlement issues, transparency and the inside information problems, taxation issues, and

accounting standards. The macroeconomic approach looks at factors such income growth, savings and investment, financial development, and inflation. As we know, both institutional and macroeconomic factors are important in stock market development. Pagano (1993) shows that regulatory and institutional factors may influence the functioning of stock markets. For example, mandatory disclosure of reliable information about firms may enhance investor participation, and regulations that instil investor's confidence in brokers should encourage investment and trading in the stock markets. This study takes the macroeconomic approach. There are two reasons for doing so. First, accurate information on an institutional variable is limited for many of the sample economies. Second, institutional factors are directly reflected in macroeconomic factors. It has been shown that some institutional measures such as legal rule are highly correlated with stock market liquidity, while stock market liquidity is one of the macroeconomic determinants we examine in this study. For example, Demirguc-Kunt and Levine (1996b) find that countries with well-developed regulatory and institutional systems tend to have large, liquid stock markets.

The stock market size, as measured by market capitalization divided by GDP, simply measures the value of listed shares on a country's stock exchanges as a share of GDP, is used in the study also following Levine and Zervos (1998a). They found that it is not robustly correlated with the economic growth, capital accumulation, and productivity improvements which was consistent with theory. Simply listing on the national stock exchange does not necessarily foster resource allocation. Rather, it is the ability to trade the economy's productive technologies easily that influences resource allocation and growth. Theory does not suggest the mere listing of shares will influence resources allocation and growth. Levine and Zervos (1998) show that market capitalization is not a good predictor of economic growth.

The stock market capitalization ratio sharply went up over the years. For example, Hong Kong, with a ratio of 105.37 in 1990, increased to 1085.5 in 2014. Economies with a capitalization ratio higher than 100 were Japan (113.3), South Africa (111.69) and Hong Kong in 1990. This number increased to 6 in 2014. The average value climbed to 96.53 in 2014 from 35.61 in 1990.

Urbanisation

To measure the urbanization level, urbanization ratio, calculated as urban population as a share of the total population is used in the study. However, measurements of the urban population must be taken with care- What classifies as an "urban area" can vary on country level, with definitions corresponding to those used by national statistical offices when collecting census data. Such definitions may refer to threshold population levels in a settlement (typically 5,000 or 10,000), but the status of a city can also be assigned on administrative, legal or historical reasons. While the UN aims to ensure consistency and adjusts data in particular when senses definitions change over time, it is hard to rule out some degree of country heterogeneity in what constitutes an urban area (Hofmann and Wan, 2013).

Controlled variable for urbanisation and growth

Control variables for growth include variables commonly used in the literature (Beck et al. 2000; Levine et al. 2000) such as average years of schooling, to control for human capital; the volume of trade as a share of GDP, to capture the degree of openness. In order to control and better estimate the dependent variable of urbanisation, the study follows the work of Hofmann and Wan (2013) to use GDP per capita growth, education, industrialization, LogGDP, population density, trade primacy as controlled variables in the equation.

Education

Education, controlling for human capital accumulation, as measured by average years of total schooling of the adult (25+) population, comes from Barro and Lee (2010). Also, Demirguc-Kunt, Feyen, Levine (2011), Hofmann and Wan (2013) have used this proxy for education. It is expected that the coefficient for

education will be positive. Abramovitz (1986) and Lucas (1993) among others argue that a better-educated population augments a country's ability to absorb and adopt new technologies and to innovate. United States, New Zealand, Australia, Israel, Sweden, Norway, Netherlands, Canada and Switzerland all had more than 10 years for the average years of schooling for adults over 25 years old in 1990 while the United States was the highest with 12.32 years. However, adults older than 25 in Turkey, Brazil, Thailand, Nigeria, Indonesia, India and Morocco in 1990 went to school averagely shorter than 5 years. Morocco, with 2.11 years ranked the last one among the sample. In 2010, the number of economies with longer than 10 years increased to 21, both Switzerland and the United States had 13.42 years which were the highest number, however, Morocco was the last one with 4.24 years in 2010. The average level among the 43 economies was 7.45 years in 1990 and 9.83 years in 2010. It is notable that the education condition is improving, although the whole situation is very unequal in the world.

Industrialization

Industrialization, also used by Hofmann and Wan (2013), is measured as non-agricultural share of GDP. Industry corresponds to ISIC divisions 10-45 and includes manufacturing (ISIC divisions 15-37). It comprises value added in mining, manufacturing (also reported as a separate subgroup), construction, electricity, water, and gas. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification (ISIC), revision 3. Note: For VAB countries, gross value added at factor cost is used as the denominator.

The industry value added as a percentage of GDP is highest in Saudi Arabia in 2014 with 57.37%, following by China and Indonesia with a percentage over 40% while France, Greece, and Hong Kong's industry only added lower than 20% of their GDP, especially Hong Kong has only 7.26%.

Trade

Trade, calculated as exports plus imports of goods and services as a share of GDP, denotes a country's openness to trade, is a common control variable for economic growth. It is used as a proxy for the importance of international factors in influencing economic activity. Thus, trade is also an important variable for urbanisation development research. Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments. The values for this indicator come from the World Development Indicators (Revisions of 2016). In 2014, 10 economies' traded more than 100% to their GDP, they were Hong Kong, Hungary, Netherlands, Malaysia, Thailand, Switzerland, Mauritius, Jordan, Austria, and Denmark. Specially, Hong Kong had a very high percentage of 438.76%. Argentina and Brazil, with 29.28% and 25.11% respectively traded the least among the sample economies in 2014.

Primacy

Primacy denotes the population in the largest city as a percentage of urban population, come from the World Development Indicators (Revisions of 2015) and was also used by Hofmann and Wan (2013). Economists and statisticians use several different methods to track economic growth. As Hong Kong has a 100% urban population, it ranks the first along the years in the primacy proxy value. In 1990, Portugal had the biggest population in the largest city as a percentage of the urban population which was 53% while Netherland, the United States, Poland, Germany, India, and China all had lower than 10%. China, with a

percentage of 2.6%, was the only one lower than 5%. Such condition hardly changed over the years. In 2014, apart from Hong Kong, Israel, Portugal, Chile and Peru had a percentage higher than 40% while Indonesia, Poland, the United States, Netherland, India, Germany and China had a percentage lower than 10%. From 2.6% in 1990, China's population in the largest city as a percentage of urban population increased to 3.1% over the 25 years.

GDP

The most well-known and frequently tracked metric is gross domestic product, or GDP. LogGDP, as the most common measurement of the economic activity, Log Real GDP, which equals to logarithm of GDP in current U.S. dollars, is a widely used proxy which was also used by Demirguc-Kunt, Feyen, Levine (2011). GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Countries with the highest GDP per capita in 1990 are Switzerland, Finland and Finland with 38332, 30162 and 28381 U.S dollars while the lowest GDP per capita holding countries in 1990 are India ($375), Nigeria ($322) and China ($316). Countries with the highest GDP per capita in 2014 are Norway, Switzerland and Australia with 97430, 85611 and 61996 U.S dollars while the lowest GDP per capita holding countries in 2014 are Morocco ($3190), Philippine ($2873) and India ($1576).

Density

Density, known as the population density (people per sq. km of land area), is midyear population divided by land area in square kilometers. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. Land area is a country's total area, excluding area under inland water bodies, national claims to continental shelf, and exclusive economic zones. In most cases the definition of inland water bodies includes major rivers and lakes.

Population

The variable Population is based on the de facto definition of population. The values shown are midyear estimates. The top 3 countries with the largest population and smallest in both 1990 and 2014 among the sample are the same, the largest ones are China, India and United States while smallest ones are New Zealand, Jamaica and Mauritius. During the 25-year time, China's population increased for 229085000 while Mauritius's is only 202159. The growth of China's population during the 25 years is nearly 182 times of the population of Mauritius in 2014. (with 1135185000, 870601776, and 249623000 while the smallest population countries in 1990 are New Zealand (3329800), Jamaica (2390000) and Mauritius (1058775). Countries with the largest population in 2014 are China, India and United States with 1135185000, 870601776, and 249623000 while the smallest population countries in 1990 are New Zealand (4509700), Jamaica (2720554) and Mauritius (1260934).)

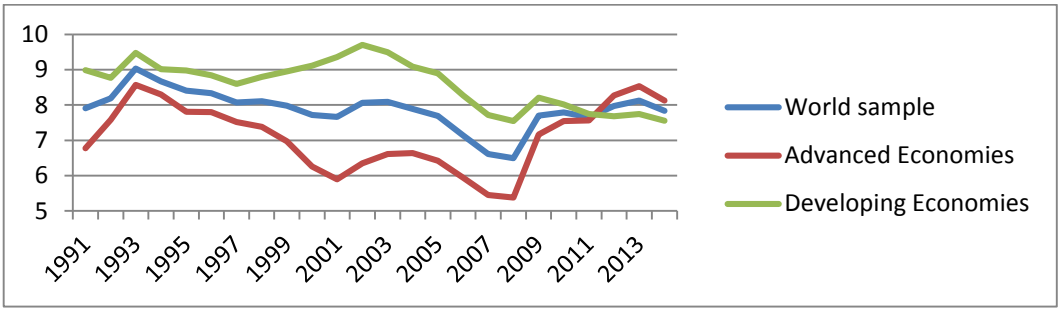
Population growth

Population growth, used as proxy for growth of the labour force, is the annual population growth rate for year t is the exponential rate of growth of midyear population from year t-1 to t, expressed as a percentage. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. In the sample data, the population in Jordan grows the fastest over the years; it ranks the first regards of the population growth percentage in both 1990 and 2014 with 4.54% and 2.75% respectively. On the other hand, negative population growth already appeared in Portugal and Hungary in

1990 with -0.22% and -1.03%. The number of countries with negative population growth increased to 6 among the sample in 2014, they are Poland, Japan, Hungary, Spain, Portugal, Greece and Germany.

Unemployment

Unemployment ratio, unemployment refers to the share of the labour force that is without work but available for and seeking employment.



Graph 4. Comparison of Unemployment

Economies with the highest unemployment ratio in 1990 are South Africa, Spain, Jamaica and Jordan, they all had a ratio over 15 while South Africa was the highest with 24.5. The lowest unemployment ratio in 1990 belonged to Thailand, South Korea, Japan, Hong Kong and Switzerland as they were all below 3. Counties with a ratio over 20 seemed to increase over the years as in 2014, Greece, South Africa and Spain all valued over 20 while only Malaysia and Thailand had a ratio below 3 in 2014. Surprisingly, only 0.9% of the labour force in Thailand is unemployed in 2014, which is a very low level among all the economies.

Infrastructure

Due to the limited available data on infrastructure proxy in the World Development Indicators (Revisions of 2016), four aspects relating to infrastructure were selected to jointly represent the infrastructure level of an economy. They are (1) the logarithm of electric power consumption (kWh per capita); Electric power consumption measures the production of power plants and combined heat and power plants less transmission, distribution, and transformation losses and own use by heat and power plants. (2) mobile cellular subscriptions (per 100 people); Mobile cellular telephone subscriptions are subscriptions to a public mobile telephone service that provide access to the PSTN using cellular technology. The indicator includes (and is split into) the number of postpaid subscriptions, and the number of active prepaid accounts (i.e. that have been used during the last three months). The indicator applies to all mobile cellular subscriptions that offer voice communications. It excludes subscriptions via data cards or USB modems, subscriptions to public mobile data services, private trunked mobile radio, telepoint, radio paging and telemetry services. (3) fixed telephone subscriptions (per 100 people); Fixed telephone subscriptions refers to the sum of active number of analogue fixed telephone lines, voice-over-IP (VoIP) subscriptions, fixed wireless local loop (WLL) subscriptions, ISDN voice-channel equivalents and fixed public payphones. (4) internet users (per 100 people). The final infrastructure indicator is equally weighted index of the above four data. There is obvious limitation of this indicator as these four aspect cannot capture and reflect the real infrastructure level of an economy. Internet users are individuals who have used the Internet (from any location) in the last 12 months. Internet can be used via a computer, mobile phone, personal digital assistant, games machine, digital TV etc.

Government consumption

Government is calculated as general government final consumption expenditure as a percentage of GDP. Formerly named general government consumption, it includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditure

on national defence and security, but excludes government military expenditures that are part of government capital formation. Government consumption expenditure is vital in assessing the importance of fiscal policy in providing the public goods for both individuals and business, especially in education, health care and infrastructure. However, this variable also captures whether government expenditure creates distortions, which in turn lower growth.

Inflation

Inflation, as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.

GDP per capita growth

GDP per capita growth (annual %) is the annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

A table of the full variables employed in the model is presented below.

Table 7. Varibales and Definations

No.	Varibales	Label	Detail
	Endogenous:		
1	Bank	Bank depth	Private credit by deposit money banks to GDP (%)
2	Sto	Stock market liquidity	Stock market turnover ratio (%)
3	Urban	Urbanization development level	Urban population (% of total)
	Exogenous:		
4	Fin	Financial intermediaries stability	Liquid liabilities to GDP (%)
5	Margin	bank efficiency	Bank net interest margin (%)
6	Credit	bank stability	Bank credit to bank deposits (%)
7	Value	Stock market value	Stock market total value traded to GDP (%)
8	Return	Stock market return	Stock market return (%, year-on-year)
9	Cap	Stock market efficiency	Stock market capitalization to GDP (%)
10	LogVolat	Stock market stability	Stock price volatility
11	Poplgrow	Population growth	Population growth (annual %)
12	Unemp	Unemployment ratio	Unemployment, total (% of total labour force) (modelled ILO estimate)
13	Infra	Infrastructure	INFRA1 – the logarithm of electric power consumption (kWh per capita) INFRA2 - Mobile cellular subscriptions (per 100 people)

			INFRA3 - Fixed telephone subscriptions (per 100 people) INFRA4 - Internet users (per 100 people) INFRA – equally weighted index of the above four
14	Trade	Trade ratio	Exports plus imports of goods and services as a share of GDP
15	Density	Population density	Population per square km
16	Primacy	Primacy ratio	Population in the largest city as a percentage of urban population
17	Industrialization	Industrialization ratio	Non-agricultural share of GDP
18	Population	Population	Population
19	LogEduca	Average years of schooling on adult(25+)	Log (1+average years of schooling)
20	LogGdp	Log (GDP)	Log (GDP per capita)
21	GDPpcgrow	GDP per capita growth	
22	Inflation	Inflation ratio	Inflation, GDP deflator (annual %)
23	Government	Government consumption	General government final consumption expenditure (% of GDP)
24	Develop	Dummny varibale	Develop=1, advanced economies Develop=0, developing economies

To fully assess the strength of the independent link among bank depth, stock market liquidity, and urbanisation, averaged five year long term data like in the study of Beck and Levine (2004) was also generated to explore the long run relationship.

Following the method frequently used in the existing literature, long run relationship can be tested using the averaged five year interval data (Levine, Loayza and Beck, 2000; Levine, 2005). However, an important disadvantage of employing data averaged over five year periods is that whether it is adequately proxy for long run conditions. Therefore, the panel methods may be less precise in assessing the finance growth relationship than methods based on lower frequency data (Levine, 2005). However, such kind of analysis should be extend by exploring whether the effect will be different in systematic ways depending on the level of economic development and income status of an economy. Similar sub group empirical studies were done by Rioja and Valev (2004a) for countries at different stages of economic development. They splinted the sample into three groups which are low income countries, middle income countries, and high income countries. The results are consistent with previous empirical work that finds that the effects of finance on economic growth may vary in different types of countries. For example, Xu (2000), Demetriades and Hussein (1996), De Gregorio and Guidotti (1995), and Odedokun (1996). These works generally find a stronger effect of finance on economic growth in more developed economies, although the issue has not been systematically studied.

3.3 Model and Estimation Method

This study contributes to the literature by examining the systematic interaction among bank depth, stock market liquidity, and urbanisation. Modifying the previous work by Shrieves and Dahl (1992), this study uses a standard Simultaneous Equations Model (SEM) and Three-stage Least Squares (3SLS) model to

recognize the relationship among bank depth, stock market liquidity, and urbanisation. A standard structural equations model (SEM) is estimated, thereby allowing a non-zero correlation between the residuals of the equations for each dependent variable. Note that failure to allow for the interdependence across equations could be benign or it could confound the correlation of residuals with the effects of the independent variables (Greene, 2002). By using the 3SLS technique, the model explicitly recognizes the endogeneity of changes in the dependent variables, and as such, is preferable to single-equation Ordinary Least square (OLS).

3.3.1 Estimations

Simultaneous Equation Model

As a statistical model, Simultaneous Equations Model (SEM) is formed by a set of linear simultaneous equations. When there is only one dependent variable on the left hand side of the equation and one or more explanatory variables on the right hand side of the equation, the model is called a single equation model. Also, a set of equations indicating a systematic relationship among the regressors or explaining the joint dependence of variables is considered to be the simultaneous equation. More than one equation and more than one of the correlated dependent or endogenous variable exist in this kind of model.

Two-Stage least squares (2SLS)

Two-Stage least squares (2SLS) regression analysis is a statistical technique that is utilized in the analysis of structural equations. This method is the extension of the ordinary least square (OLS) technique. It is utilized when the dependent variable's residual terms are associated with the explanatory variables. Moreover, it is helpful when there are feedback loops in the model. In structural equations modelling, we utilize the maximum likelihood technique to appraise the path coefficient. This method is an option in SEM modelling to assess the path coefficient. This method can likewise be used in quasi-experimental studies.

2SLS has five underlying assumptions: models (equations) ought to be effectively identified; the residual variance of all the variables ought to be equal; residual terms ought to be normally distributed; it is expected there are no outliers in the data; observations ought to be independents of each other.

There are three key terms about 2SLS, which are problematic causal variable, Instruments, and estimation stages. Problematic causal variable denotes that the dependent or endogenous variable whose residual term is correlated with the other dependent variable residual term. A problematic causal variable is replaced with the substitute variable in the first stage of the analysis. The term ‘instruments’ here means instrument variable. An instrument variable is utilized to to create a new variable by replacing the problematic variable.

The underlying logic of the estimation stages is as the followings. In ordinary least square (OLS) technique, there is a fundamental assumption that the residual terms are independent of the regressor variables. When this assumption does not hold, this method can help taking care of the problem. This examination assumes that there is a secondary predictor that is correlated to the problematic predictor but not with the residual terms. Given the presence of the instrument variable, the following two techniques are adopted: (1) In the first stage, a new variable is generated using the instrument variable; (2) In the second stage, the model resulted values from stage one are then utilized in place of the actual values of the problematic predictors to process an ordinary least square (OLS) model for the response of interest.

Seemingly Unrelated Regression (SURE)

In a multivariate regression model, the residuals in various equations may be correlated. For this situation, the proficiency of the estimation may be enhanced by considering these cross-equation correlations.

The Seemingly Unrelated Regressions (SUR) or Seemingly Unrelated Regression Equations (SURE) model is a generalisation of a linear regression model proposed by Arnold Zellner (1962). The model consists of several regression equations and each has its own dependent variable and various sets of exogenous explanatory variables. The equations can also be estimated separately as every one of them is a valid linear regression itself. Also because of this, the regression method is named as Seemingly Unrelated Regressions. It is also suggested by some economists that "seemingly related regression" will be a better name for this framework as the error terms are correlated across the equations. Like OLS, the SUR method expects that all the regressors are independent variables; however SUR uses the relationships among the residuals in different equations to improve the regression results. The SUR method requires an underlying OLS regression to process residuals. The OLS errors are used to assess the cross-equation covariance matrix. The model can be estimated equation-by-equation using standard ordinary least squares (OLS). Because of the feasible generalized least squares with a certain form of the variance-covariance matrix, the SUR estimation is generally more efficient than the OLS method although the OLS are consistent. There are two conditions that SUR will play the same role as the OLS estimation. That is, when there is no relationship among the error terms across equations, in other words, the error terms in each equation are uncorrelated. The other situation, although very rare to happen, could generate same results from SUR and OLS when the independent variables in the equations are exactly the same. The SUR model is thought to be a simplification of the general linear model that the coefficients in the matrix are equal to zero. Also, it is considered to be the generalisation of the general linear model in which the independent variables is for sure to be different in each equation. Nevertheless, the further extension of the SUR model is a structural equations model in which the regressor independent varibales can be endogenous one.

Three-Stage least squares (3SLS)

Zellner and Theil (1962) came up with an idea of combining the 2-stage least squares (2SLS) method with the seemingly unrelated regressions (SUR) and called the new combination as the 3 Stage least squares estimator. They did this with the argument that single equation estimates could be made more proficient and found that 3SLS is better in the same conditions with the estimates being consistent and asymptotically normal. So, it can be said that 3SLS was an asymptotic improvement over single equation estimates and this improvement was due to a combination of two existing method of 2SLS and SUR. The details of the method and its usage are explained below.

As the first step the requirements of the cross-equation are imposed along with setting a diagonal covariance matrix. Secondly, equations, which may be linear or non-linear, are then analysed to obtain the estimates for the 3SLS. Now it could be explained that the diagonal of the covariance matrix was used to cover the disturbances across the different equations. But the 2SLS estimator constrains this It obtains instrumental variable estimates, considering the covariances across equation disturbances also. The objective function for three stage least squares (3SLS) is the total of squared transformed fitted error terms. The exogenous variables will be adopted to instrument every one of the equations, so that the actual instrumental variable matrix has the structure given by Jorgenson and Laffont (1974), rather than that given by Amemiya (1977). In a simultaneous equations model, this implies that a variable cannot be exogenous to one equation and endogenous to another.

Comparison

Considering the cross equation correlations, results generated by 3SLS and SURE are more efficient. The 2SLS technique does not exploit the relationship of the disturbances across equations. 3SLS models are considered to be more useful if there are cross-correlations in the error terms of the equations, and ought to bring better efficiency than 2SLS. That is, 3SLS is valuable when the model need to test cross-equations restrictions which would otherwise be difficult or impossible to achieve using 2SLS. The fundamental

preferred advantage of 3SLS over 2SLS is an increase in asymptotic efficiency. 3SLS are, under general conditions, asymptotically more proficient than 2SLS. By emphasising to higher stages until convergence the resulting estimates are identical with maximum likelihood estimates (Oberhofer and Kmenta, 1974).

In the real world, the financial intermediary, stock market and the real economy's urbanization development are not independent of each other, instead, they are inextricably linked and have a multi causal relationship which constitutes an interactive system. Research has been done on correlations between elements like financial development, income gap, country's openness (Baltagi, Demetriades and Siong, 2009), technology improvement, customer demand (Panda and Tapan, 2003), foreigh direct investment (Carkovic, 2002), trade credit and industry growth (Fisman, Love, 2003), currency rate changes, currency demand, etc. The simultaneous equation model considers the interaction and influence of different variables on the basis of the system, so that the relationship within the economic system can be expressed in a complete and effective way. Compared with the single equation model, the simultaneous equation model is more suitable for the study of the relationship aong financial intermediaries, stock market and urbanization while in the same time the results are more effective.

By the command ***reg3***, STATA estimates a system of structural equations, where some equations contain endogenous variables among the explanatory variables. Typically the endogenous regressors are dependent variables from other equations in the system.

3.3.2 Equations

The system is considered of three equations in this study. The first equation explains bank depth; the second equation models stock market liquidity; the third equation explains urbanisation development level. The specifications are as follows:

The Bank depth Equation:

$$BANK_{it} = x_0 + x_1 FIN_{it} + x_2 MARGIN_{it} + x_3 CREDIT_{it} + x_4 STO_{it} + x_5 URBAN_{it} + x_6 BANK_{i,(t-1)} + \varepsilon_{it} \quad (1)$$

The Stock Market liquidity Equation:

$$STO_{it} = \rho_0 + \rho_1 VALUE_{it} + \rho_2 RETUR_{it} + \rho_3 CAP_{it} + \rho_4 LOGVOLAT_{it} + \rho_5 BANK_{it} + \rho_6 URBAN_{it} + \rho_7 STO_{i,(t-1)} + e_{it} \quad (2)$$

The Urbanization Equation:

$$URBAN_{it} = \alpha_0 + \alpha_1 POPULATION_{it} + \alpha_2 UNEMP_{it} + \alpha_3 INFRA_{it} + \alpha_4 LOGEDUCA_{it} + \alpha_5 TRADE_{it} + \alpha_6 LOGGDP_{it} + \alpha_7 DENSITY_{it} + \alpha_8 PRIMACY_{it} + \alpha_9 INDUSTRIALIZATION_{it} + \alpha_{10} POPLGROW_{it} + \alpha_{11} GOVERNMENT_{it} + \alpha_{12} INFLATION_{it} + \alpha_{13} GDPPCGROW_{it} + \alpha_{14} BANK_{it} + \alpha_{15} STO_{it} + \alpha_{16} URBAN_{i,(t-1)} + \sigma_{it} \quad (3)$$

A comparison between different estimators is presented here. The Simultaneous Equations Model is estimated using there different method: 2SLS, 3SLS, and SURE. It is obvious that there are slightly differences among the three estimation results. Differences exist in all the coefficient values. However, it is notable that the significance levels of all the parameters are exactly the same for the results of Three-stage Least Squared (3SLS) and Seemingly Unrelated Regression (SURE). It is also notable that the values for R-squared are very high for all the three equations, which indicates that after considering the controlled

variables, the dependent variables are well explained by the explanatory regressors in the model. After careful consideration, this study will deploy the estimation results of Three-stage Least Squared (3SLS) method to do the further analysis. The reasons why Three-stage Least Squared (3SLS) method is chosen are explained in the model and estimation specification part.

Table 8. 2SLS, 3SLS, and SURE estimaton

Equations	VARIABLES	2SLS	3SLS	SURE
BANK	sto	-0.00739	-0.00694	-0.00275
	urban	0.0369***	0.0375***	0.0368***
	fin	0.0421***	0.0458***	0.0447***
	margin	-0.279**	-0.175	-0.161
	credit	0.0543***	0.0542***	0.0529***
	L.bank	0.915***	0.915***	0.917***
	Constant	-3.056**	-3.781***	-3.940***
	R-squared	0.982	0.982	0.982
STO	bank	0.0954***	0.0983***	0.100***
	urban	-0.0698	-0.0685	-0.0698
	value	0.314***	0.316***	0.316***
	retur	0.306***	0.314***	0.312***
	cap	-0.187***	-0.189***	-0.189***
	logvolat	13.32**	14.51**	14.12**
	L.sto	0.657***	0.652***	0.654***
	Constant	-0.886	-2.432	-2.088
	R-squared	0.774	0.774	0.774
URBAN	logeduca	0.134**	0.139**	0.137**
	trade	0.00326***	0.00331***	0.00333***
	loggdp	2.096***	2.041***	2.013***
	density	-0.000226***	-0.000234***	-0.000237***
	primacy	0.00769***	0.00788***	0.00808***
	industrialization	0.00663***	0.00541***	0.00531***
	population	0.00337***	0.00316***	0.00314***
	poplgrow	0.00147	0.00463	0.00559
	unemp	-0.000234	-0.00113	-0.000925
	infra	-0.00504***	-0.00486***	-0.00490***
	government	0.00744**	0.00666*	0.00655*
	inflation	0.00481***	0.00434***	0.00415***
	gdppcgrow	0.00389	0.00255	0.00233
	bank	0.00136***	0.00127***	0.00123***
	sto	0.000350	0.000220	0.000005
	L.urban	0.996***	0.996***	0.996***
	Constant	-1.338***	-1.244***	-1.232***
	R-squared	1.000	1.000	1.000

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From the estimation results, insignificant parameters, meaning that the impact of them on the researched dependent variables are not important and can be ignored, will be eliminated from the model specification in order to get the actual significant interaction system for the researched questions. Thus, four insignificant parameters, POPLGROW (population growth), UNEMP (unemployment ratio), GDPPCGROW (GDP per capita growth), and STO (stock market turnover ratio) are eliminated in the urbanization equation. Two insignificant parameters, STO (stock market turnover ratio) and MARGIN (bank efficiency, measured by

bank net interest margin) are eliminated in the bank equation. Three insignificant parameters, URBAN (urbanization ratio), CAP (stock market efficiency, measured by stock market capitalization to GDP), and LOGVOLAT (stock market stability, measured by stock market price volatility) are eliminated in the stock market equation.

The Bank Equation:

$$BANK_{it} = x_0 + x_1 FIN_{it} + x_2 CREDIT_{it} + x_3 URBAN_{it} + x_4 BANK_{i,(t-1)} + \varepsilon_{it}$$

(4)

The Stock Market Equation:

$$STO_{it} = \rho_0 + \rho_1 VALUE_{it} + \rho_2 RETUR_{it} + \rho_3 CAP_{it} + \rho_4 LOGVOLAT_{it} + \rho_5 BANK_{it} + \rho_6 STO_{i,(t-1)} + e_{it}$$

(5)

The Urbanization Equation:

$$URBAN_{it} = \alpha_0 + \alpha_1 POPULATION_{it} + \alpha_2 INFRA_{it} + \alpha_3 LOGEDUCA_{it} + \alpha_4 TRADE_{it} + \alpha_5 LOGGDP_{it} + \alpha_6 DENSITY_{it} + \alpha_7 PRIMACY_{it} + \alpha_8 INDUSTRIALIZATION_{it} + \alpha_9 GOVERNMENT_{it} + \alpha_{10} INFLATION_{it} + \alpha_{11} BANK_{it} + \alpha_{12} URBAN_{i,(t-1)} + \sigma_{it}$$

(6)

Table 9. 3SLS on Model Building

Equations	VARIABLES	Model building(3SLS)
BANK	urban	0.0199*
	fin	0.0401***
	credit	0.0447***
	L.bank	0.936***
	Constant	-3.549***
	R-squared	0.982
STO	bank	0.0695**
	value	0.331***
	retur	0.208***
	cap	-0.194***
	logvolat	13.44**
	L.sto	0.628***
	Constant	-1.926
	R-squared	0.728
URBAN	logeduca	0.109*
	trade	0.00372***
	loggdp	1.840***
	density	-0.000238***
	primacy	0.00650***
	industrialization	0.00615***
	population	0.00331***
	infra	-0.00397***
	government	0.00280
	inflation	0.00216***
	bank	0.000634*
	L.urban	0.997***
	Constant	-1.092***
	R-squared	1.000

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The Bank Equation:

$$BANK_{it} = -3.549 + 0.0401 * FIN_{it} + 0.0447 * CREDIT_{it} + 0.0199 * URBAN_{it} + 0.936 * BANK_{i,(t-1)} + \varepsilon_{it}$$

(7)

The Stock Market Equation:

$$STO_{it} = -1.926 + 0.331 * VALUE_{it} + 0.208 * RETUR_{it} - 0.194 * CAP_{it} + 13.44 * LOGVOLAT_{it} + 0.0695 * BANK_{it} + 0.628 * STO_{i,(t-1)} + e_{it}$$

(8)

The Urbanization Equation:

$$URBAN_{it} = -1.092 + 0.00331 * POPULATION_{it} - 0.00397 * INFRA_{it} + 0.109 * LOGEDUCA_{it} + 0.00372 * TRADE_{it} + 1.840 * LOGGDP_{it} - 0.000238 * DENSITY_{it} + 0.00650 * PRIMACY_{it} + 0.00615 * INDUSTRIALIZATION_{it} + 0.00280 * GOVERNMENT_{it} + 0.00216 * INFLATION_{it} + 0.000634 * BANK_{it} + 0.997 * URBAN_{i,(t-1)} + \sigma_{it}$$

(9)

3.3.3 Sub Group Analysis

Advanced and developing economies

Because of the wide range of the economy sample which covers economies in different economic development level, does this interaction system differ between advanced and developing economies? In order to learn the divided impact, same regression methods were conducted on split sample and the result are showed in the table below.

Table 10. Advanced Economies and Developing Economies

Equations	VARIABLES	Advanced economies	Developing economies
BANK	sto	-0.0229***	-0.00680
	urban	-0.0466	0.00629
	fin	0.123***	0.0527***
	margin	0.709	-0.0537
	credit	0.128***	0.0310***
	L.bank	0.795***	0.916***
	Constant	-1.784	-1.292
	R-squared	0.968	0.978
STO	bank	-0.0548	0.179***
	urban	0.236	-0.124
	value	0.339***	0.347***
	retur	0.475***	0.249***
	cap	-0.209***	-0.185***
	logvolat	11.57	27.80***
	L.sto	0.573***	0.639***
	Constant	0.280	-20.80*
	R-squared	0.744	0.777
URBAN	logeduca	0.110	0.0663
	trade	4.76e-05	0.00542***
	loggdp	2.005***	0.673***
	density	-7.73e-05	-0.00537***
	primacy	0.00666**	0.00246
	industrialization	-0.00746*	-0.0114***
	population	-0.00648	0.00791***
	poplgrow	-0.0936**	0.0576***
	unemp	-0.0203***	-0.00406
	infra	-0.00398**	0.00351***
	government	0.0208***	-0.0206***
	inflation	0.0111	0.00126
	gdppcgrow	-0.00492	-0.00184
	bank	0.000446	-0.00182***
	sto	0.000625	0.000360
	L.urban	0.998***	0.980***
	Constant	-0.872	1.906***
	R-squared	0.999	1.000

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The overall conclusions in the last section do not hold for economies in different economic development level after split the sample into advanced economies and developing economies. Both the coefficient values and the significance values are different for the two groups.

As regards of the significance level, while TRADE (trade openness), DENSITY (population density), POPULATION (population level), BANK (bank depth), are highly significant in the urbanization equation for developing economies, they seem do not matter for advanced economies at all as they are not significant even in 10% level. Also, while INDUSTRIALIZATION, POPLGROW (population growth), INFRA (infrastructure ratio) are important in both advanced and developing economies for deciding the urbanization level, they seem to be more important in developing economies. On the other hand, PRIMACY (primacy ratio), UNEMP (unemployment ratio) play important roles in predicting the urbanization level in advanced economies but are not important for developing economies.

Same situation exist in the bank depth equation. STO (stock market turnover ratio) are significant predictor for the bank depth in advanced economies but cannot do the same good job in the developing economies.

In the stock market liquidity equation, the biggest variation lies in the parameter LOGVOLAT (stock market stability, measured by stock market price volatility). It has a highly significant positive impact of 28.66 for the stock market performance in the developing economies but does not play any significant role for advance economies.

Besides, while BANK (bank depth) is a significant regressor in the stock market equation for both advanced and developing economies, it influences the stock market performance negatively in advanced economies but positively in developing economies. Meanwhile, the positive impact for the developing economies is more significant than the negative impact on advance economies.

Time subgroup

In order to get a multi-dimensional and comprehensive understanding of the relationship among bank depth, stock market liquidity, and urbanisation of the sample economies, looking at the panel dataset in a time series aspects can also be helpful and beneficial to enrich the empirical results. The time periods are divided by two criteria: 1) financial crisis; 2) long run relationship and short run relationship

Financial crisis

The term financial crisis is connected comprehensively to an assortment of circumstances in which some financial assets suddenly lose an expansive part of their nominal value. Due to the strong liquidity of financial assets, the international level of finance is very high. The fuse of the financial crisis can be of any country's financial products, markets and institutions, etc. The feature of the financial crisis is that people are pessimistic about the economic future, substantial devaluation of the value of the currency, great reduction in the total economic productivity and economic scale, big declining in economic growth, often accompanied by closing down of a large number of enterprises, increased unemployment rate, the general economic depression, sometimes even with the social and political turmoil.

The 2007-2008 global financial crisis, also known as the financial tsunami, the credit crisis and the Wall Street tsunami, is a financial crisis that began in 09 August, 2007. Since the credit crisis broke out, investors began to lose confidence in the value of mortgage securities, which then led to triggering liquidity crisis. Even if the central bank repeatedly injects huge amounts of money to the financial markets, the outbreak of the financial crisis cannot be stopped. Until 2008, the financial crisis began to get out of control, and led to the closure of a large number of large financial institutions or took over by the government.

Effect of financial crisis on the banking sector

The financial crisis that started in 2007 decimated the banking sector. Various banks went under, others have to be rescued by the government and still others were constrained into mergers with more grounded partners. The basic stocks of banks got crushed, their preferred stocks were likewise squashed, profits were cut and heaps of financial specialists lost part or the greater part of their assets.

The explanations behind this were more complex than what had generally realised by people. The straightforward answer was that it happened as a result of the housing bubble burst, however that is the surface of the issue. Part of the issue was a liquidity issue because of "mark to market" accounting required by the government and part was the number of bad mortgage loans banks held on their books. To diversify is what this financial crisis taught for shareholders. Unfortunately, numerous individuals had quite a bit of their investment in bank stocks since they were paying such high dividends.

Table 11. Financial Crisis: Before, During, and After

Equations	VARIABLES	Before 2007	07-08 crisis	After 2008
BANK	sto	-0.00590	-0.0154	-0.00344
	urban	0.0385**	0.0463	0.0162
	fin	0.0251*	-0.0323*	0.0648***
	margin	-0.213	0.253	0.0180
	credit	0.0626***	0.0269*	0.0235**
	L.bank	0.919***	1.039***	0.931***
	Constant	-3.704*	-2.544	-2.878
	R-squared	0.977	0.992	0.989
STO	bank	0.0950**	0.0724	0.0534
	urban	-0.138	0.0668	-0.0595
	value	0.426***	0.222***	0.230***
	retur	0.320***	0.359***	0.0848
	cap	-0.208***	-0.149**	-0.138***
	logvolat	25.00***	-81.01***	15.00
	L.sto	0.616***	0.797***	0.669***
	Constant	-10.76	107.9***	-3.304
	R-squared	0.763	0.858	0.800
URBAN	logeduca	0.0662	0.0733	0.164*
	trade	0.00241***	0.00702***	0.00465***
	loggdp	1.668***	3.211***	2.554***
	density	-0.000179***	-0.000413***	-0.000245***
	primacy	0.00621***	0.0102***	0.00899***
	industrialization	0.00677**	-0.00309	0.00760**
	population	0.00299***	-0.00222	0.000324
	poplgrow	0.0309	-0.205***	-0.0466*
	unemp	-0.00321	-0.00334	-0.00506
	infra	-0.00191	-0.0357***	-0.0239***
	government	0.00280	0.0107	0.0220***
	inflation	0.00510***	0.0218***	0.00554**
	gdppcgrow	0.00792	0.0127	-0.000304
	bank	0.00147***	0.00388***	0.00211***
	sto	0.000552	0.00286***	0.000489
	L.urban	0.996***	1.005***	1.000***
	Constant	-0.974***	-1.564***	-1.313***
	R-squared	1.000	1.000	1.000

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

It is easy to see that financial crisis did make a significant change on the whole interaction system of bank, stock market and urbanization. Both the coefficient and significant level changed a lot according to the estimation results.

In the bank depth equation, URBAN (urbanisation level) used to play a significant role on in predicting bank depth. But such impact no longer exist when the financial crisis happens and afterwards. The impact of CREDIT (bank stability, measured by bank credit to bank deposits) decreased a lot when the financial crisis happen, and then changed back to become a strong predictor again but not as much as before as showed in the significant level. In the stock market liquidity equation, BANK (bank depth, measured by private credit by deposit money banks to GDP), LOGVOLAT (stock market stability, measured by stock price volatility), and RETUR (stock market return) used to play important role, however, such influence disappeared during and after the financial crisis. CAP (stock market efficiency, measured by stock market capitalisation to GDP)'s impact became slightly less during the financial crisis. In the urbanization equation, LOGEDUCA (education level) became important after the financial crisis taken place. During the financial crisis, the impact INDUSTRALIZATION used to have disappeared, but formed again after the crisis finished. POPULATION no longer play any significant role on promoting urbanization development as soon as financial crisis taken place. However, POPLGROW (population growth), which did not play any role before, starting to become more and more important in predicting urbanization development as the regressor is negatively highly significant in 1% confidence level during the financial crisis. Although this high significance level dropped to 10% confidence level, it is still worth to be noticed as it used to positively related with the urbanization, but for some reason, the relationship become then negative. GOVERNMENT (government size) become very important after the financial crisis, and the positive impact it has on the urbanization development level become increasingly large from before the crisis, during the crisis, and after the crisis. STO (stock market liquidity, measured by stock market turnover ratio), particularly, is only highly significant during the financial crisis. Before the crisis, STO used to negatively correlate with the urbanization development level. Such kind of relationship changed into a positive one when the crisis happens.

From the above result, it is not hard to conclude that the 2007-2008 financial crisis did make a change in the economy in many macro and micro aspects. This study also makes an innovative contribution to the existing literature about the impact of financial crisis. Are such influences subjective to the 2007-2008 financial crisis? Or it is a generalised phenomenon for the financial crises. Further research is needed to explore whether such kind of impact is applicable to all the financial crises, and what are the potential macro elements that can positively help the financial crisis situation.

Long run relationship

The existing literatures include finding both the long run and short run relationship between finance and growth. However, seldom research was done for the same dataset with a comparison of the difference in the long run and short run effect.

In this study, the sample time period is from 1990 to 2014 for 25 years. The above analysis uses annual data for each year within the sample period. Next, a five year interval average dataset is generated on basis of the annual data and will be used to explore the long run relationship among the three researched elements. The average value from 1990 to 1994 is denoted as year1, and year2, year3, year4, year5 representing the average value for the data for 1995 to 1999, 2001 to 2004, 2005 to 2009, 2010 to 2014 respectively.

Table 12. Summary Statistics: 1990-2014 (Long Run & Mean, Median, Max, and Min)

Year		Bank	Sto	Urban
1990-1994	Mean	55.81701	48.79724	65.40419
	Median	47.4622	47.4622	72.68
	Max	173.496	176.425	99.8656
	Min	6.6039	1.21754	18.541
1995-1999	Mean	63.15328	57.11804	66.92971
	Median	52.1211	49.6177	73.9188
	Max	186.033	197.874	100
	Min	10.7857	3.18163	18.4796
2000-2004	Mean	69.15667	62.54497	68.47781
	Median	69.9411	57.3204	75.3622
	Max	147.598	183.486	100
	Min	12.7574	3.35948	18.4184
2005-2009	Mean	79.20687	78.04957	70.19955
	Median	77.7511	69.7952	76.9204
	Max	185.788	216.589	100
	Min	9.28955	2.82795	18.3574
2010-2014	Mean	86.00142	59.82701	71.82393
	Median	84.1052	56.2251	78.4024
	Max	193.344	192.677	100
	Min	11.8078	4.02031	18.3094
Total	Mean	70.52307	61.26737	68.56704
	Median	64.8016	48.1053	74.6902
	Max	193.344	216.589	100
	Min	6.6039	1.21754	18.3094

Analysis of long run relationship is more common and was done in Levine, Loayza and Beck (2000) for the long run analyasis. For example, Levine and Zervos (1998) used long run data to study the relationship among stock markets, banks, and economic growth and found a positive correlation between stock market liquidity and economic growth, as well as between banking development and the economic growth. Such kind of positive relationship is consistent with the concept that a greater ability to trade ownership of an economy's productive technologies facilitates efficient resource allocation, physical capital formation, and faster economic growth. Loayza and Ranciere (2002) firstly extend the empirical inquiry by differentiating between the long-run and short-run relationships connecting finance and economic activity. They suggest that short-run surges in bank lending can actually signal the onset of financial crises and economic stagnation. They emphasise that it is therefore crucial to consider simultaneously the short-run and long-run effects of financial development.

Followed this suggestion, using the same model specification, estimation method, and dataset as in the previous section, apart from taking the average value for all the variables in a 5 year interval, the following results were generated for the short run relationship and long run relationship among the three researched dependent variables.

Table 13. Short Run and Long Run Relationship

Equations	VARIABLES	Short run	Long run
BANK	sto	-0.00694	-0.0645**
	urban	0.0375***	0.108*
	fin	0.0458***	0.240***
	margin	-0.175	-1.550**
	credit	0.0542***	0.239***
	L.bank	0.915***	0.578***
	Constant	-3.781***	-8.901
	R-squared	0.982	0.912
STO	bank	0.0983***	0.149***
	urban	-0.0685	-0.197*
	value	0.316***	0.713***
	retur	0.314***	0.509***
	cap	-0.189***	-0.394***
	logvolat	14.51**	44.59***
	L.sto	0.652***	0.380***
	Constant	-2.432	-23.83
	R-squared	0.774	0.792
URBAN	logeduca	0.139**	4.052**
	trade	0.00331***	0.0155***
	loggdp	2.041***	8.406***
	density	-0.000234***	-0.000728**
	primacy	0.00788***	-0.00250
	industrialization	0.00541***	0.0336*
	population	0.00316***	0.0140*
	poplgrow	0.00463	-0.0185
	unemp	-0.00113	-0.0103
	infra	-0.00486***	-0.0182*
	government	0.00666*	0.00113
	inflation	0.00434***	0.0379**
	gdppcgrow	0.00255	-0.0275
	bank	0.00127***	0.00889**
	sto	0.000220	0.00610
	L.urban	0.996***	0.990***
	Constant	-1.244***	-7.792***
	R-squared	1.000	0.994

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

It is clear that variations exist in both coefficient value and the significance level. In the urbanization equation, PRIMACY, GOVERNMENT are significant for the urbanization development level in short run period but are not in the long run period, among which PRIMACY is highly significant. INDUSTRILATION, POPULATION, INFRA (infrastructure ratio), INFLATION, BANK (bank depth) are all significant in both long run and short run analysis. However, they tend to be more significant in the short run period than in the long run period.

While most of the coefficients show a stronger impact in the long run period, exception like PRIMACY indicate a positive short run effect on the urbanization level but a negative long run effect. Countries need to pay attention on these kind of macroeconomic element since promoting them can benefit the economy in short run but harm it in long run. Need to be carefully considered before the implementation. POPLGROW (population growth) has positive but not significant impact on urbanization in short run but has

negative but not significant impact in the long run. In the bank depth equation, STO (stock market liquidity), MARGIN (bank efficiency, measured by bank net interest margin) are significant in the long run but not in the short run. URBAN(urbanisation level) are more significant in the short run than in the long run although in the long run it is also significant. In the stock market equation, BANK (bank depth), RETUR (stock market return) are more significant in the short run than in the long run while LOGVOLAT (stock market stability, measured by stock price volatility), is significant in the long run but not in the short run. And the impact is nearly four times larger in the long run than in the short run.

As expected, the long run affects also various among economies in different development level.

Table 14. Long Run Relationship and Advanced & Developing Economies

Equations	VARIABLES	Long run	Long run (advanced)	Long run (developing)
BANK	sto	-0.0645**	-0.0627*	-0.0434
	urban	0.108*	-0.225	-0.00224
	fin	0.240***	0.421***	0.260***
	margin	-1.550**	3.034	-0.564
	credit	0.239***	0.422***	0.124***
	L.bank	0.578***	0.367***	0.609***
	Constant	-8.901	-10.51	-1.517
	R-squared	0.912	0.901	0.893
STO	bank	0.149***	-0.0866	0.244**
	urban	-0.197*	0.0310	-0.248*
	value	0.713***	0.661***	0.813***
	retur	0.509***	0.271	0.723***
	cap	-0.394***	-0.375***	-0.292***
	logvolat	44.59***	51.64**	30.03
	L.sto	0.380***	0.325***	0.431***
	Constant	-23.83	-17.36	-20.14
	R-squared	0.792	0.807	0.796
URBAN	logeduca	4.052**	4.213**	3.572
	trade	0.0155***	-0.00754	0.0151**
	loggdp	8.406***	6.218	4.650*
	density	-0.000728**	0.000272	-0.00794***
	primacy	-0.00250	0.00624	-0.0116*
	industrialization	0.0336*	-0.0528	0.0239
	population	0.0140*	-0.0301	0.0186**
	poplgrow	-0.0185	-0.442	0.0463
	unemp	-0.0103	-0.102**	0.0127
	infra	-0.0182*	0.000452	-0.00690
	government	0.00113	0.0989**	-0.120***
	inflation	0.0379**	0.0821	0.0298*
	gdppcgrow	-0.0275	-0.00129	-0.132
	bank	0.00889**	0.00105	0.0226***
	sto	0.00610	0.00112	0.000465
	L.urban	0.990***	0.961***	0.985***
	Constant	-7.792***	-2.624	-3.019
	R-squared	0.994	0.983	0.996

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4. Results and Discussion

4.1 Result Discussion

The relationships between the three researched elements, bank depth, stock market liquidity, and the urbanisation development level are rather complicated after dividing the sample economies into several different groups.

Before taking account of the various stages of the sample economies, in the SEM built according to the results from the Three-Stage Least Square (3SLS) method, a positive contribution of urbanisation development was found to the bank depth level; bank depth in the same time has positive impact on the stock market performance and a small positive influence on the urbanisation development level. All these influences are statistically significant after controlled for the potential determinants in the equations. Among these three positive impacts, the biggest magnitude lies in the impact for bank depth to the stock market liquidity.

Considering all the other regressors in the model specification, bank stability (proxy by CREDIT and measured by bank credit to bank deposits) has the biggest positive impact on the bank depth; stock market stability (proxy by LOGVOLAT and measured by stock price volatility) has the greatest influence on the stock market performance; and economic growth level (proxy by LOGGDP and measured by gross domestic product level) has the largest promotion influence on the urbanisation development level. It is notable that for the financial sector, both the financial institution: bank, and the financial market: stock market, reply on the internal stability for the growth. It reflects that fact that growth depends largely on stability. This finding is also worth considered for the country policy makers. Further research can be done to find out whether stability is the most important influencing factor for growth.

4.2 Cross Model Consideration

4.2.1 Results differ for different sample group

Consistent with what was found in the recent literature about different sub group in the country sample, countries in different economic development level should adopt different momentary and fiscal policies according to their own macroeconomic environment. In this study, the sample economies were split into two groups according to the division of IMF, namely advanced economies and developing economies. Further research about this conclusion can be done in the area of all the macroeconomic aspects. Research about variation in the legal origin has already been done by Beck, Demirguc-Kunt and Levine (2003). The variations among all these elements have more or less influence on every aspects of the economic activity in the society. Taking all these into consideration is not only for a pursue of a high R-squared value in the regression analysis, as most equation include lagged value of dependent variable which contributes a

4.2.2 Financial crisis

Financial crisis is considered as a big attack for an economy in various aspects. As closely related objectives with the finance, bank, and the stock market, respectively denotes as financial institutions and financial markets, cannot avoid the influences of financial crisis. The influence of bank depth on the stock market performance is no longer significant during and after the financial crisis taken place. According to theory, there is positive influence of bank depth on the stock market liquidity which lies in the bank's function. However, the power of such function was eliminated when the financial crisis taken place. Because financial crisis has negative impact on the economy. However, stock market liquidity normally do not play any significant role on promoting the urbanisation development, the regression results showed that the insignificantly negative impact of stock market liquidity turns into a significant and positive impact on the

urbanisation development. Besides, the promoting influences should be resulted from the indirect influence of economic growth. While urbanisation used to positively and significantly correlate with bank depth, the occur of financial crisis decreased such correlation.

4.2.3 Vanishing effect

Despite the fact that most of the magnitude of coefficient in the comparison of short run and long run analysis are larger in long run, which indicates a stronger influence in the longer time period. It also showed that in the results of the comparison, regressors such as primacy ratio, population growth and GDP per capita growth have a positive impact on the urbanisation development first in the short run analysis. However, such impact turns to be negative when estimating in the long run term. The changes in the sign of the coefficient denote that the positive impact of these regressors on the dependent variable reaches a top within several years, and stopped to be beneficial for the urbanisation growth.

However, is positive growth a good thing all the time? The above analysis based on the pursue of a positive growth in both economic growth and urbanisation development level. Deeper bank depth, in other words, more private credit by deposit money banks to GDP, and larger stock market turnover ratio is expected in the simultaneous equations. Too much finance? Too much bank? Too much population in urban area? If there is a "vanishing effect" on the impact of the regressors, what is the turning point? Such kind of situation was notice by Arcand, Berkes and Panizza (2012) in the paper "Too Much Finance?" After examining whether there is a threshold above which financial development no longer has a positive effect on economic growth, they suggest that finance starts having a negative effect on output growth when credit to the private sector reaches 100% of GDP. The results were showed to be consistent with the "vanishing effect" of financial development. The recent financial crisis also raised considerations that some countries may have financial systems which are "too large" compared to the size of the domestic economy. Wolf (2009) pointed out that over the last three decades the US financial sector grew six times faster than nominal GDP and argued that there is something wrong with a situation in which:" instead of being a servant, finance had become the economy's master." Rodrik (2008) asked whether there is evidence that financial innovation has made our lives measurably and unambiguously better.

4.2.4 The unexpected predictors

Through fully comparison of the statistical results of Betas from the regression analysis, it is notable that some of the controlled variables are much more significant and larger in coefficient than what the study was expected initially. For example, in the long run relationship results, the impact of MARGIN (bank efficiency, measured by bank net interest margin) on BANK (bank depth), the influence of LOGVOLAT (stock market stability, measured by stock price volatility), the impact of LOGEDUCA (average years of schooling) on the urbanisation development, are relatively greater among all the modelling regressors.

4.3 Limitations and further research

This research of the MRes dissertation is an initial stage for the Ph.D research project. The multi-dimensional empirical findings provide an insightful overview for the broad topic of finance and growth. However, limitations exist due to the nature of the sample data and the short length of the 12 months MRes programme; further research targeting points were found of the reference for the future research.

4.3.1 Limitations

Proxy

Analysing a relatively new dataset of 43 economies for the time period 1990 to 2014, the data was carefully selected to make the whole dataset a strongly balanced one. This target has limit the expansion of the sample size amount. Newly available indicators such as bank access (Honohan, 2008; Cihak, Demirguc-Kunt,

Feyen, Levine, 2013) do not have a satisfactory amount over the selected years. Meanwhile, although the sample data was divided into the short run term and long run term to compare the time effect differences, the control variable for human capital accumulation in the urbanisation equation, LOGEDUCA, has data available only for the long run specification, which means, in 5 years interval. Thus, when analysing the short run effect, duplicate data for 5 years was used to represent the education level. Another control variable INFRA, indicating infrastructure level in a country, is driven from the World Development Indicators (Revisions of 2016), which has a set of 43 indicators available covering infrastructure aspects like railways, air transport, telephone and internet, water source and electricity, etc. Infrastructure helps determine the success of manufacturing and agricultural activities. Investments in water, sanitation, energy, housing, and transport also improve lives and help reduce poverty. And new information and communication technologies promote growth, improve delivery of health and other services, expand the reach of education, and support social and cultural advances (World Bank, 2016). However, the available data is too limited in the sample time period defined in this study. Only four relatively adequate indicators were selected and formed an equally weighted index as a proxy for the infrastructure level. However, these four indicators aggregate in the area of internet, telecommunication and electric power and cannot well represent the real infrastructure level of a country. To solve this problem, more wide time ranged dataset is needed.

Model specification

Although 25 exogenous variables are used in the regression analysis, unbalanced model specifications exist cross equations reflecting by the different magnitude of the R-squared. While both the bank depth equation and the urbanisation development level equation have a high R-squared value of more than 0.9, the stock market liquidity equation holds around 0.7-0.8. In this case, better and more comprehensive set of regressors need to be identified through empirical studies to explore the stock market liquidity determinants.

Causality relationship

Although the various correlations was analysis in this study using different estimation techniques and sample groups on the large panel dataset, the remaining causality relationships have not been discussed systematically. This achievable limitation will be overcome in the later research.

4.3.2 Further research

Further research can be targeted in the Time division point: the financial crisis. Variances exist in the systematic interactions among bank, stock market, and growth (economic or urban) before, during, and after financial crisis. How long does it take for such changes to disappear or will it change permanently?

Results found a significantly positive predictor for growth- stability. How to make use of such predictions of stability for growth? As from the result of all the three equations, stability is a very important promoting factor for the performance. Further research can be done to find out whether impact magnitude of stability for growth. This is also very important for the country policy makers as the current situation about the worldwide finance is not stable.

5. Conclusion

If finance and growth are related, are bank depth, stock market liquidity, and urbanisation related as well? What is the systematic interaction among these three elements? Will the correlation be different for countries at various stages of economic development? Will the interaction be the same for different time measurement and special financial event? These questions driven the conduct of this study. Trying to

understand the complex relationship among the three elements, bank depth, stock market liquidity, and urbanisation in all the 43 sample economies and for those at various stages of economic development and different time period, the results present an insightful reference for the understanding of the economic conditions and the decision of countries' policy makers.

In this study a Simultaneous Equations Model (SEM) was used to investigate the systematic relationship and interaction among three important macro-economic factors: bank depth, stock market liquidity, and urbanisation development level in 43 economies. Using panel data for the period 1990 to 2014, evidence suggests that positive and significant impact from bank depth to stock market liquidity while mutual positive effect exists between urbanisation and bank depth. The stock market liquidity impact urbanisation positively but such impact is not significant. However, since both bank depth and stock market liquidity both positively predict urbanisation when entered together in the regression, the results are consistent with the views that financial development provides important services to growth, in this case, the growth of urbanisation (Levine and Zervos, 1998; Levine, 2005).

More importantly, detailed multi-dimensional comparisons were conducted in the study. Evidence was founded that the magnitude of the relationship differs for economies sample group in different economic development level and time period. The relationship cannot aggregate to a generalisation. Thus, different monetary and fiscal policies should be adopted according to the country's own macroeconomic environment. More specifically, financial crisis made a big impact on the systematic interactions among the bank depth, stock market liquidity, and urbanisation while stability is found to be of great importance for the growth.

This research of the MRes dissertation is an initial stage for the Ph.D research project. The multi-dimensional empirical findings provide an insightful overview for the broad topic of finance and growth. Limitations exist due to the nature of data and the short length of the 12 months MRes programme. It is arguable that limitations of unavailable data, unbalanced model specification across equations and lack of causality estimation exist in the study and need to be addressed in the further research.

Further research problems like the impact of financial crisis on the finance and growth in wide aspects like stock market liquidity, urbanisation is worth exploring using simultaneous equation model to find the systematic interaction with a control of the correlated residuals in the equations. Also, stability is found to be a significant element for the overall growth. Therefore, more detailed research about the direct and indirect impacts of stability in both financial institutions and financial markets is worth researching.

Nevertheless, given that a link among bank depth, stock market, and urbanisation is established, valuable policy reference can be taken from empirical results.

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